ARCHIVES OF OPHTHALMOLOGY.

ONE HUNDRED CONSECUTIVE CASES OF CATARACT EXTRACTION.

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UNTIL the year 1745, cataracts were operated upon by the couching method. Instead of removing the opaque lens from the eye as we now do, it was pushed into the lower part of the vitreous chamber. As early as 1708, Jean Louis Petit, a French surgeon, opened the cornea to remove a cataract which had been dislocated into the anterior chamber. Extraction of cataract, though, began with Jacques Daviel, also a French surgeon, about the middle of the eighteenth century. A hermit, having lost one eye by the couching method, saw Daviel at Marseilles in 1745 regarding the other eye. He made a keratonyxis but did not succeed in displacing the cataract into the vitreous chamber. The lens matter fell into the anterior chamber and, together with blood, completely filled this portion of the eye. Daviel decided to try the plan of Petit. He opened the anterior chamber with a curved needle and enlarged the wound with scissors. The contents of the anterior chamber escaped, leaving the pupil clear so that the hermit was able to distinguish objects held before him. The eye was lost by infection.

Although this case was unsuccessful, Daviel determined to remove cataracts through an opening in the cornea. He made the operation the first time on a woman; the

pupil was clear and the result brilliant. Daviel's operation was much modified by himself later, and his method was taken up by operators in every country, so that after 1850 the displacement or couching operation was very little done. To-day surgeons differ regarding the best technic for Daviel's extraction operation.

At the Section on Ophthalmology of the American Medical Association held at Atlantic City, N. J., in 1907, papers were presented by representative men, in which they give their views regarding the method of operating for cataract, etc. Surgeons, I think, almost universally agree regarding the preparation of the patient and instruments, as to whether or not the case is operable, and in reference to the anæsthetic to be used, but different ideas exist as to; (1st) the best incision for the extraction of the cataract; (2d) whether or not to do the simple operation (without iridectomy) or the combined one (with iridectomy); (3d) whether to make the iridectomy (if we decide upon the combined operation) some weeks before the cataract is removed (preliminary iridectomy), or immediately before the extraction; (4th) whether or not irrigation of the anterior chamber is advisable in removing cortical matter, blood, air bubbles, etc.

1st. In the series of 100 cases which are herewith tabulated (traumatic cataracts not included), two forms of corneal incision were used. The one most frequently adopted was an upward section involving fully two-fifths of the cornea and following the periphery of the cornea, the central point of the flap falling on the vertical meridian of the cornea. This incision I prefer in all cases of uncomplicated cataract or in cases where there is not likely to be infection from diseased conjunctiva or from tear-duct trouble. It matters little what the age of the patient may be, provided marked senile changes have not taken place. But in subjects who are somewhat debilitated by chronic diseases, such as asthma, bronchitis, diabetes, etc., people in whom we might

expect infection from pathogenic conditions of the conjunctiva, lachrymal apparatus, nasal mucous membrane; or in patients whose cornea, through senile degeneration or lowered vitality due to whatever cause, may have become flabby, so that union of the lips of the wound may be slow, the writer prefers a conjunctival flap about three millimetres in breadth.

2d. In this series of cases, as will be seen, the combined operation was performed in each instance. The iridectomy in twenty-three cases, however, was made about six weeks preliminary to the extraction. From what the writer has seen and read of the simple extraction, he never cared to take the responsibility of subjecting the patient to unnecessary risks which could be eliminated by taking out a small piece of iris, and therefore the simple operation has never been attempted. Many surgeons have had brilliant results with the simple operation, but still more brilliant results are obtained by the combined plan. About the only advantage in not removing a piece of iris is that it leaves the pupil round, while the disadvantage of not doing an iridectomy are many. In the simple operation the surgeon dreads a prolapse of the iris, which frequently happens, and which is sure to greatly impair, if not completely destroy, the sight. It is much more convenient to remove cortical matter if an iridectomy has been made; in fact, if the iris has been left intact, frequently a quantity of lens matter has to remain in the eye, relying upon nature to remove it. It is a disadvantage if much cortical matter or blood is permitted to remain, because a portion of it may become organized, thereby causing the secondary cataract—which follows in about 20 per cent. of the operations—to become more thick than it otherwise would. The thinner and more delicate the membrane which we call secondary cataract, the better the result is regarding vision, after discission. Then, too, we are much more likely to have glaucoma develop unless a portion of iris is removed. The visual

result with iridectomy compares most favourably with the resulting vision obtained in an eye in which an iridectomy has not been made. In fact the advantages of the combined operation so far surpass those of the simple that the writer believes that erelong the simple operation will lose favor with those who strongly adhere to it at present.

3d. Shall we do the iridectomy at the time of the extraction or some weeks before the removal of the lens? Each side of the question has warm advocates. A preliminary iridectomy certainly has some advantages, although I usually remove the iris just previous to the capsulotomy. In all cases where we have a rigid iris, a tendency to rheumatism and glaucoma, or where we have an immature cataract, a preliminary iridectomy should be done. With a preliminary iridectomy we are not so likely to have iritis develop, as we eliminate considerable bruising which naturally follows the forcing of a lens between the raw, unprotected edges of the incised iris. We are not so likely to be annoyed with hemorrhage in extraction after preliminary iridectomy, thereby preventing the view of the field of operation from becoming obscure. But when the patient presents decided senile changes, when there is a remote possibility of infection, or when we have a case of old chronic bronchitis or nasal catarrh, then the iridectomy should immediately precede the capsulotomy, as I do not think it wise to open the cornea twice, thereby jeopardizing the eye twice to infection.

4th. Following the teaching of Dr. J. A. Lippincott, with whom I have been associated since 1896, I use irrigation of the anterior chamber as a routine measure. American literature has not been abundant on this subject, and until within the last few years we have heard only from Dr. Lippincott and Dr. C. H. Williams. Recently Drs. Reik, Ellett, and Bulson have added interesting and instructive articles along this line. The objections to this method which have been advanced

are; (1st) that it necessitates the introduction of an additional instrument into the eye; (2d) that escape of vitreous is encouraged; (3d) that the effect upon the iris predisposes to inflammation of this structure.

1st. Regarding the first objection I have found that a well constructed irrigator, such as the Lippincott anterior chamber syringe, performs the duties of the iris replacer in a much more elegant and satisfactory manner. This irrigator is made absolutely aseptic by boiling. The tip of the nozzle, which is introduced into the anterior chamber, is not any larger than the tip of the ordinary iris replacer. "It matters little," as Reik says, "whether three or four instruments are used in an operation provided they are aseptic and used with the necessary care required by the work to be done."

2d. As for encouraging escape of vitreous, in the 97 cases of this series in which irrigation was used there was no escape of vitreous. In cases 13, 56, and 80, in which vitreous escaped, the accident happened just after expulsion of the lens. Escape of the vitreous I do not think is so likely to happen by this method as by the old one of stroking the cornea or by pressure upon the eyeball by means of the finger upon the eyelid.

3d. Regarding iritis, as you will see later, I have had little experience with it after extractions. The fluid used is a sterile normal salt solution, temperature about that of the body. We do not advocate the use of antiseptic solutions in washing out the interior of the eye during cataract extraction.

The advantages of intra-capsular irrigation can be presented no better than by quoting from Dr. Lippincott's remarks upon H. O. Reik's excellent paper, "Why not Employ Intra-Capsular Irrigation in Cataract Operations?" read before the American Ophthalmological Society, in 1903. They are as follows: "It removes not only cortical remains, but blood, and air bubbles promptly, efficiently, and without violence. In this way, in all

probability, it lessens the frequency and the thickness of capsular opacities, thus making necessary a smaller number of secondary operations to improve vision. It gently and thoroughly replaces the iris if it protrudes, and it probably, as McKeown claims, 'gives tone to the iris tissue and so may tend to prevent subsequent prolapse.' Furthermore, it perfectly frees the lips of the wound from cortical material and shreds of capsule, and thus permits the accurate coaptation necessary to perfect healing. It also, in those cases in which the cornea remains depressed after the operation, re-establishes the corneal dome, and in this manner mechanically places the wound lips in accurate contact."

TABLE 1.

No.	Sex, Age, Eye, General Health	Quality of Cataract. Functional Examination	Preliminary Iridectomy or not	Operation	Resulting vision
1	Male, 66 L. E Good.	Senile. Projection good.	Yes. 6–1–99	Aug. 1, 1899. Cortical matter remaining after expulsion of nucleus removed by irrigation. Operation smooth. Healing normal.	L. E. + 10.=20/XXX
2	Male, 59 R. E. Good.	Senile in highly myopic eye.	Yes. 6–2–99	Sept. 14, 1899. After expulsion of nucleus cortical matter removed by irrigation. Operation smooth. Glaucomatous symptoms developed after the operation. Choroidal changes to inner side of optic nerve.	R. E. + 2.5=20/CC
3	Male, 65 L. E. Good.	Senile. Projection good.	No.	Sept. 4, 1900. Large quantity of cortical matter remained, readily removed by irrigation. Operation smooth.	L. E. + 9.5 ⌒ + 2. cy 160° = 20/XXX
4	Female, 64 L. E. Good.	Senile. Projection good.	Yes. 6–17–01	July 29, 1901. Operation smooth. Cortical matter removed by irrigation. Three months later opaque capsule. Discission 6–30–02.	L. E. + 11. ⌒ + 1.5 cy 3° = 20/XXX

TABLE 1 (*Continued*)

No.	Sex, Age, Eye, General Health	Quality of Cataract. Functional Examination	Preliminary Iridectomy or not	Operation	Resulting vision
5	Female, 63 L. E. Good. Colored.	Senile. Projection good.	Yes. 4–23–01	Aug. 8, 1901. Operation smooth. Some cortical matter removed by irrigation.	L. E. + 9.5 = 20/xx
6	Female, 66 R. E. Not very robust.	Senile. Projection good.	Yes. 6–17–01	Aug. 12, 1901. Moderate amount of cortical matter removed by irrigation. Operation smooth. Discission 2–21–07.	R. E. + 10. ⊂ + 2. cy 135° = 20/xx
7	Male, 60 R. E. Good.	Senile. Projection good.	Yes. 7–23–01	Sept. 2, 1901. Removed cortical matter by irrigation. Operation smooth. A week after the operation counted fingers at 15 inches.	Case did not return after leaving the hospital.
8	Male, 55? L. E. Epileptic.	Senile. Projection good.	Yes. 10–14–01	Dec. 27, 1901. Cortical matter removed by irrigation.	L. E. + 10. ⊂ + 2. cy Hor. = 20/xxx
9	Female, 21 L. E. Good.	Soft cataract. Projection good.	Yes. 1–9–02	Feb. 14, 1902. Irrigation used to remove soft milky substance. Discission 3–15–04.	L. E. + 12. = 20/xx
10	Male, 58 R. E. Good.	Senile. Projection good.	Yes. Had been made by another surgeon.	Feb. 27, 1902. Cortical matter removed by irrigation. Operation smooth.	R. E. + 9. ⊂ + 3. cy 121° = 20/xx
11	Male, 64 R. E. Good.	Senile. Projection good.	Yes. 1–30–02	March 20, 1902. Cortical matter removed by syringe. Smooth.	R. E. + 10. ⊂ + 1. cy Hor. = 20/xxx
12	Male, 45 L. E. Good.	Congenital opacity with physiological coloboma of iris down. Projection good.	No.	April 17, 1902. Incision downwards in lower half of cornea. Lens removed through the coloboma. Irrigation used to remove some cortical matter.	After operation eye became very red and occlusion of pupil followed.
13	Male, 43 L. E. Good. Dwarf.	Senile. Projection good.	Yes. 3–7–02	April 24, 1902. After extraction a gush of vitreous followed. The eye was at once closed, and irrigation was not attempted.	L. E. + 12. = 20/xxx

TABLE 1 (*Continued*)

No.	Sex, Age, Eye, General Health	Quality of Cataract. Functional Examination	Preliminary Iridectomy or not	Operation	Resulting vision
14	Female, 55 R. E. Good.	Senile. Highly myopic. Projection good.	Yes. 3–25–02	May 13, 1902. Cortical matter removed by irrigation. Operation smooth.	R. E. + 2.5 cy horizontal = 20/XX
15	Female, 66 L. E. Good.	Senile. Projection good.	Yes. 5–22–02	July 10, 1902. Removed cortical matter by irrigation. Operation smooth.	L. E. + 10. ⊂ + 2. cy 165° = 20/XXX
16	Male, 58 R. E. Epileptic.	Senile. Projection good.	Yes. 6–5–02	July 28, 1902. Cortical matter removed by irrigation. Operation smooth. Opaque capsule. Would not have discission, said could see well enough with left eye. See case No. 8 in this list.	R. E. + 11. = 20/CC
17	Male, 73 L. E. Good.	Senile. Projection good.	No.	July 28, 1902. Operation smooth. Irrigation used. Iritis.	L. E. + 7. ⊂ + 4. cy Hor. = 20/L
18	Male, 77 R. E. Not robust.	Senile. Projection good.	Yes. 5–31–02	July 29, 1902. The lens was very large and eye rather soft. Removed some cortical matter by irrigation. Operation smooth. Iritis. Opaque capsule. Discission, May 25, 1903.	R. E. + 10. = 20/XL
19	Male, 71 L. E. Good.	Senile. Projection good.	Yes. 6–20–02	Aug. 13, 1902. Cortical matter removed by irrigation.	L. E. + 10. = 20/XX
20	Female, 74 R. E. Health fair.	Senile. Projection good.	Yes. 5–20–02	Sept. 1, 1902. Cortical matter removed by irrigation. Operation smooth. Discission for opaque capsule 10–21–03.	R. E. + 10. ⊂ + 3 cy. 11° = 20/XX
21	Male, 82 L. E. Feeble.	Senile. Projection fair.	No.	Sept. 19, 1902. Cortical matter removed by irrigation. Operation smooth. Atrophy of optic nerve.	L. E. + 9. = 20/CC
22	Male, 82 R. E. Feeble.	Senile. Projection not very good.	No.	Sept. 22, 1902. Cortical matter removed by irrigation. Operation smooth. Some atrophy of optic nerve.	R. E. + 9. = 20/LXXX

TABLE 1 (*Continued*)

No.	Sex, Age, Eye, General Health	Quality of Cataract. Functional Examination	Preliminary Iridectomy or not	Operation	Resulting vision
23	Male, 64 L. E. Good.	Senile. Projection good.	Yes. 8–18–02	Sept. 22, 1902. Cortical matter removed by irrigation. Operation smooth.	L. E. + 11. ⊂ + .75 cy Hor. = 20/XXX
24	Female, 74 R. E. Good.	Senile. Projection good.	Yes. 10–3–02	Nov. 17, 1902. Large quantity of cortical matter removed by irrigation. Operation smooth.	R. E. + 10. ⊂ + 2.5 cy Hor. = 20/XL
25	Female, 65 R. E. Very large woman.	Senile. Projection good.	Yes. 10–2–02	Nov. 18, 1902. Cortical matter removed by irrigation. Operation smooth.	R. E. + 8. ⊂ + 3. cy Hor. = 20/XXX
26	Female, 73 L. E.	Soft, milky. Projection good.	No.	Nov. 20, 1902. Patient very nervous. Did not use syringe.	L. E. + 11. = 20/XX
27	Male, 72 R. E. Good.	Senile. Projection good.	Yes. 10–17–02	Dec. 4, 1902. Cortical matter removed by irrigation. Operation smooth. Iritis.	R. E. + 10. ⊂ + 1.5 cy 10° = 20/L
28	Male, 78 L. E. Feeble.	Senile. Projection good.	No.	Nov. 25, 1902. Cortical matter removed by irrigation. Operation smooth.	L. E. + 11. ⊂ + 2. cy 170° = 20/XL
29	Male, 70 L. E. Feeble.	Senile. Projection good.	No.	Jan. 2, 1903. Cortical matter removed by irrigation. Operation smooth.	L. E. + 9. ⊂ + 1. cy 135° = 20/XL
30	Male, 67 R. E. Good.	Senile. Projection good.	No.	Jan. 14, 1903. Cortical matter removed by irrigation. Operation smooth.	R. E. + 9. ⊂ + 1.5 cy Hor. = 20/XX
31	Male, 22 L. E. Good.	Soft. Projection good.	No.	Feb. 9, 1903. Cortical matter liquid, removed by irrigation. Operation smooth. Discission 2–18–04.	L. E. + 11. ⊂ + 2. cy 5° = 20/XXX
32	Female, 43 L. E. Good.	Hard. Projection good.	No.	March 12, 1903. Lens came out, leaving clear pupil. Irrigation not necessary. Operation smooth.	L. E. + 11. = 20/XX
33	Male, 83 R. E. Very feeble.	Senile. Projection good.	No.	March 23, 1903. Cortical matter removed by irrigation. Operation smooth. Discission 5/–5–04.	R. E. + 10. ⊂ + 1.5 cy 10° = 20/LXXX

TABLE I (*Continued*)

No.	Sex, Age, Eye, General Health	Quality of Cataract. Functional Examination	Preliminary Iridectomy or not	Operation	Resulting vision
34	Male, 66 R. E. Very feeble.	Senile. Projection good.	No.	March 28, 1903. Cortical matter removed by irrigation. Small prolapse of iris due to a little increased tension. Glaucomatous symtoms develope, causing the iris to protrude through lips of wound. Operation smooth.	R. E. + 10. ⊂ + .5 cy Hor. = 10 ft./cc
35	Male, 52 R. E. Good.	Senile. Projection good.	No.	Apr. 2, 1903. Cortical matter removed by irrigation. Operation smooth.	R. E. + 9. ⊂ + 2. cy 130° = 20/xx
36	Male, 39 R. E. Good.	Senile. Projection good.	No.	April 3, 1903. Lens came out clear, leaving black pupil. Irrigation not used. Operation smooth.	Case did not return after he left the hospital.
37	Male, 43 L. E. Good.	Senile. Projection good.	No.	Apr. 6, 1903. Cortical matter removed by irrigation. Operation smooth.	L. E. + 10. ⊂ + 2. cy 160° = 20/xx
38	Male, 66 L. E. Very feeble.	Senile. Projection good.	No.	May 26, 1903. Large quantity of cortical matter removed by irrigation. Discision 4–28–04.	L. E. + 11. ⊂ + 1. cy 175° = 20/L
39	Male, 43 R. E. Good.	Senile. Projection good.	No.	June 2, 1903. Cortical matter removed by irrigation. Operation smooth.	R. E. + 10. ⊂ + 2. cy 20° = 20/xxx
40	Male, 58 L. E. Good.	Senile. Projection good.	No.	June 9, 1903. Cortical matter removed by irrigation. Operation smooth.	L. E. + 12. ⊂ + 1.25 cy Hor. = 20/L
41	Female, 68 L. E. Good.	Senile. Projection good.	No.	June 20, 1903. Cortical matter removed by irrigation. Operation smooth.	L. E. + 11. ⊂ + 1. cy Vert. = 20/xxx
42	Male, 34 L. E. Good.	Hard. Projection good.	No.	June 23, 1903. Lens came out, leaving clear pupil. No irrigation necessary. Smooth.	L. E. + 10. = 20/xx
43	Female, 51 R. E. Good.	Senile. Projection good. Nebulous cornea.	No.	June 23, 1903. Cortical matter removed by irrigation. Operation smooth. Discission 9–28–03.	R. E. + 10. ⊂ + 2.5 cy 25° = 20/Lxxx

TABLE I (*Continued*)

No.	Sex, Age, Eye, General Health	Quality of Cataract. Functional Examination	Preliminary Iridectomy or not	Operation	Resulting vision
44	Male, 80 L. E. Good.	Senile. Projection good.	No.	Aug. 1, 1903. Cortical matter removed by irrigation. Operation smooth.	L. E. + 10. = 20/xx
45	Female, 35 L. E. Good.	Hard. Projection good.	No.	Sept. 28, 1903. Cortical matter removed by irrigation. Smooth. Discission 9–14–04.	L. E. + 13. ⊂ − 1.5 cy 80° = 20/xxx
46	Female, 66 R. E. Good.	Senile. Projection good.	No.	Oct. 5, 1903. Cortical matter removed by irrigation. Smooth. Discission 7–24–05.	R. E. + 10. ⊂ + 3. cy Hor. = 20/xxx
47	Male, 72 L. E. Good.	Senile. Projection good.	No.	Oct. 5, 1903. Cortical matter removed by irrigation. Operation smooth.	L. E. + 10. ⊂ + 4. cy 165° = 20/xx
48	Male, 69 L. E. Good.	Senile. Projection good.	No.	Oct. 7, 1903. Cortical matter removed by irrigation. Operation smooth.	L. E. + 10. ⊂ + 1.5 cy Hor. = 20/xx
49	Female, 60 L. E. Good.	Senile. Projection good.	No.	Oct. 8, 1903. Cortical matter removed by irrigation. Operation smooth.	L. E. + 11. ⊂ + 1. cy Hor. = 20/xxx
50	Male, 64 R. E. Feeble.	Senile. Projection good.	No.	Nov. 6, 1903. Cortical matter removed by irrigation. Operation smooth.	R. E. + 10. ⊂ + 2. cy 155° = 20/xxx
51	Male, 28 L. E. Good.	Soft. Projection good.	No.	Nov. 17, 1903. Soft cortical matter removed by irrigation. Operation smooth.	L. E. + 10. ⊂ + 2. cy 175° = 20/xx
52	Female, 60 L. E. Good.	Senile. Projection good.	No.	March 2, 1904. Cortical matter removed by irrigation. Smooth.	L. E. + 11. ⊂ + 1. cy 170° = 20/xx
53	Male, 41 L. E. Alcoholic.	Senile. Projection fair.	No.	March 12, 1904. Cortical matter removed by irrigation. Atrophy of optic nerve.	L. E. + 12. = 20/L
54	Female, 57 L. E. Good.	Senile. Projection good.	No.	Apr. 20, 1904. Cortical matter removed by irrigation. Smooth.	L. E. + 10. ⌣ + 2. cy Hor. = 2 /xx

TABLE 1 (*Continued*)

No.	Sex, Age, Eye, General Health	Quality of Cataract. Functional Examination	Preliminary Iridectomy or not	Operation	Resulting vision
55	Male, 82 R. E. Feeble.	Senile. Projection good.	No.	Apr. 26, 1904. Cortical matter removed by irrigation. Smooth.	R. E. + 10. ○ +½. cy Hor. = 20/xx
56	Female, 30 L. E. Good.	Soft. Projection good.	No.	Apr. 26, 1904. Lens came out in capsule. Moderate amount of vitreous escaped. No syringe used.	L. E. + 11. = 20/xxx
57	Male, 74 L. E. Feeble.	Senile. Projection good.	No.	June 30, 1904. Cortical matter removed by irrigation. Smooth.	L. E. + 10. = 20/xx
58	Male, 73 R. E. Feeble.	Senile. Projection good.	No.	Aug. 5, 1904. Cortical matter removed by irrigation. Smooth.	R. E. + 10. ○ + 2. cy Hor. = 20/xxx
59	Female, 86 R. E. Feeble.	Senile. Projection good.	No.	Sept. 5, 1904. Cortical matter removed by irrigation. Iritis.	R. E. + 6. ○ + 8. cy 10° = 20/L
60	Female, 36 R. E. Good.	Hard. Projection good.	No.	Sept. 9, 1904. Cortical matter removed by irrigation. Smooth.	R. E. + 13. ○ + 1.5 cy 80° = 20/xx
61	Male, 60 L. E. Good.	Senile Projection good. Small pterygium.	No.	Oct. 15, 1904. Cortical matter removed by syringe. Operation smooth.	L. E. + 10. ○ + 4 cy 149° = 20/xx
62	Male, 70 R. E. Good.	Senile. Projection good.	No.	Oct. 15, 1904. Cortical matter removed by irrigation. Smooth.	R. E. + 9. 5 = 20/xx
63	Female, 55 L. E. Myopic eye. Good.	Senile. Projection good.	No.	Oct. 19, 1904. Cortical matter removed by irrigation. Smooth. Discission 2-21-06.	L. E. + 5. ○ + 3. cy 95° = 20/L
64	Male, 78 L. E. Feeble.	Senile. Projection good.	No.	Oct. 25, 1904. Cortical matter removed by irrigation. Smooth.	L. E. + 11. = 20/xL
65	Female, 75 R. E. Good.	Senile. Projection good.	No.	Nov. 4, 1904. Cortical matter removed by irrigation. Smooth.	R. E. + 10. ○ + 3. cy 5° = 20/xxx

TABLE 1 (*Continued*)

No.	Sex, Age, Eye, General Health	Quality of Cataract. Functional Examination	Preliminary Iridectomy or not	Operation	Resulting vision
66	Female, 65 L. E. Good.	Senile. Projection good.	No.	Nov. 12, 1904. Cortical matter removed by irrigation. Smooth.	L. E. + 10. ⊂ + 3. cy Hor. = 20/xx
67	Male, 20 L. E. Good.	Soft, projection not being good. Amblyopic eye.	No.	Jan. 9, 1905. Syringe used. Smooth. Done for cosmetic effect.	L. E. + 9. ⊂ + 3. cy Hor. = 20/LXXX
68	Male, 80 L. E. Good.	Senile. Projection good.	No.	Jan. 20, 1905. Cortical matter removed by irrigation. Smooth.	L. E. + 11. ⊂ + 1. cy Hor. = 20/XXX
69	Male, 68 L. E. Good.	Senile. Projection good.	No.	March 7, 1905. Syringe used. Smooth.	L. E. + 12. ⊂ — 2.5 cy 52° = 20/XXX
70	Male, 59 L. E. Good. Colored.	Senile. Projection good.	No.	March 20, 1905. Cortical matter washed out with syringe. Smooth.	L. E. + 10. ⊂ + 3. cy Hor. — 20/xx
71	Female, 56 L. E. Good. Very large woman.	Senile. Projection good.	No.	March 3, 1905. Syringe used. Operation smooth. Symptoms of glaucoma developed after operation, and the eye was slow in healing.	L. E. + 6. ⊂ + 5. cy 150° = 20/XL
72	Female, 30 L. E. Good.	Congenital. Projection good.	No.	Apr. 12, 1905. Syringe used to remove cortical matter. Operation smooth. Opaque capsule. Discission 5–31–05.	L. E. + 10. = 20/xx
73	Female, 55 L. E. Good. Myopic.	Senile. Projection fair.	No.	Jan. 8, 1905. Cortical matter removed by syringe. Operation smooth.	L. E. + 4.5 ⊂ + 1. cy 10° = 20/XL
74	Female, 48 R. E. Good.	Senile. Projection good.	No.	June 27, 1905. Cortical matter removed by syringe. Operation smooth.	R. E. + 8. ⊂ + 3. cy Hor. = 20/xx
75	Female, 63 L. E. Good.	Senile. Projection good.	No.	July 24, 1905. Syringe used. Operation smooth.	L. E. + 10. ⊂ + 1.5 cy Hor. = 20/xx
76	Female, 45 L. E. Good.	Hard. Projection good.	No.	Sept. 6, 1905. Cortical matter removed by irrigation. Operation smooth. Discission 5–31–06.	L. E. + 8. ⊂ + 3. cy 7° = 20/XL

TABLE 1 (*Continued*)

No.	Sex, Age. Eye, General Health	Quality of Cataract. Preliminary Examination	Preliminary Iridectomy or not	Operation	Resulting vision
77	Female, 17 L. E. Good.	Congenital. Projection fair.	No.	Sept. 15, 1905. Syringe used. Smooth. Congenital weakness of optic nerve.	L. E. + 13. = 20/L
78	Female, 64 R. E. Good.	Senile. Projection good.	No.	Sept. 19, 1905. Cortical matter removed by irrigation. Smooth. Discission 8–7–07.	R. E. + 10. = 20/XL
79	Female, 22 R. E. Good.	Congenital. Projection fair.	Yes. 5–3–05	Nov. 24, 1905. Syringe used. Smooth. Some congenital atrophy of optic nerve.	L. E. + 8. ⊂ + 4. cy Vert. = 20/L
80	Female, 56 R. E. Large woman.	Senile. Projection good.	No.	Nov. 27, 1905. In attempting to expel lens, vitreous appeared, so removed with wire loop. Very little loss of vitreous. Detachment of retina followed.	
81	Male, 68 L. E. Good.	Senile. Projection good.	No.	Dec. 26, 1905. Syringe used. Smooth.	L. E. + 10. = 20/L
82	Female, 59 L. E. Good.	Senile. Projection good.	No.	Dec. 26, 1905. Syringe used. Smooth. Discission 4–5–06	L. E. + 12. ⊂ + .5 cy Vert. = 20/XX
83	Female, 64 L. E. Good.	Senile. Projection good.	No.	Jan. 5, 1906. Cortical matter removed with syringe. Operation smooth.	L. E. + 9. ⊂ + 6. cy 165° = 20/XXX
84	Male, 67 L. E. Feeble.	Senile. Projection good.	No.	Jan. 15, 1906. After making incision patient squeezed the eye expelling the lens. He was very nervous so did not use syringe. Iritis followed.	L. E. + 8. ⊂ + 6. cy 5° = 20/CC
85	Male, 70 R.E. Good.	Senile. Projection good.	No.	Jan. 15, 1906. Syringe used. Smooth.	R. E. + 11. ⊂ + 2. cy 35° = 20/XL
86	Female, 17 R. E. Good	Congenital. Projection good.	No.	Feb. 1, 1906. Syringe used. Smooth. Following the discission of 5–31–06 quite an inflammation of eyeball developed with small hypopyon. The eye became quite painful and occlusion of pupil followed.	

TABLE 1 (*Continued*)

No.	Sex, Age, Eye, General Health	Quality of Cataract. Functional Examination	Preliminary Iridectomy or not	Operation	Resulting vision
87	Female, 66 L. E. Good.	Senile. Projection good. Myopic eye.	No.	Feb. 15, 1906. Syringe used. Smooth. Discission 4–24–06.	L. E. + 4. ⊂ + 5. cy Hor. = 20/L
88	Female, 81 L. E. Feeble.	Senile. Projection good.	No.	March 6, 1906. Syringe used to remove cortical matter. Smooth.	L. E. + 7. ⊂ + 4.5 cy Hor. = 20/XXX
89	Female, 37 R. E. Good.	Soft. Projection good.	No.	Apr. 10, 1906. Used irrigation to remove cortical matter. Discission 5–11–06.	R. E. + 12. ⊂ + 1. cy 30° = 20/L
90	Male, 45 R. E. Good.	Soft. Projection good.	No.	Apr. 10, 1906. Cortical matter removed by irrigation. Smooth.	Did not return after leaving hospital.
91	Female, 31 R. E. Good.	Congenital. Projection good.	Yes. 9–30–04.	Apr. 17, 1906. Syringe used to remove cortical matter. Opaque capsule. Discission 2–21–07.	R. E. + 9. ⊂ + 2. cy Hor. = 20/XL
92	Male, 74 R. E. Very feeble.	Senile. Projection fair.	No.	Apr. 24, 1906. Cortical matter removed by irrigation. Smooth.	Did not return after leaving hospital.
93	Male, 52 L. E. Good.	Senile. Projection good.	No.	Apr. 30, 1906. Cortical matter removed by irrigation. Iritis.	L. E. + 10. ⊂ + 3. cy Hor. = 20/XL
94	Male, 15 R. E. Good. Eye very amblyopic. Operation for cosmetic effect.	Soft. Projection fair.	No.	May 3, 1906. Syringe used. Smooth. Discission 10–17–06.	R. E. + 12. = 20/CC
95	Female, 56 R. E. Good.	Senile. Projection good.	No.	May 10, 1906. Syringe used to remove cortical matter. Smooth.	R. E. + 10. ⊂ + 2. cy Hor. = 20/XXX
96	Male, 48 L. E. Good.	Senile. Projection good.	No.	May 17, 1906. Cortical debris removed by irrigation. Smooth. Some iritis followed.	L. E. + 9. ⊂ + .5 cy Hor. = 20/L
97	Male, 81 R. E. Feeble.	Senile. Projection good.	No.	June 11, 1906. Cortical matter removed by irrigation. Smooth.	R. E. + 10. ⊂ + 2. cy 175° = 20/L
98	Male, 65 L. E. Good.	Senile. Projection good.	No.	June 13, 1906. Cortical debris removed by syringe. Smooth.	L. E. + 9. ⊂ + 3. cy 15° = 20/XX

TABLE 1 (*Continued*)

No.	Sex, Age, Eye, General Health	Quality of Cataract, Functional Examination	Preliminary Iridectomy or not	Operation	Resulting vision
99	Male, 82 L. E. Fair.	Senile. Projection good.	No.	June 16, 1906. Syringe used. Smooth.	L. E. + 10. ⊂ + 1.5 cy 5° = 20/XXX
100	Female, 49 R.E. Good.	Senile. Projection good.	No.	Sept. 11, 1906. Cortical matter removed by irrigation. Smooth.	R. E. + 12. = 20/XX

TABLE 2.—SUMMARY OF VISUAL RESULTS.

In 32 cases V. =	20/XX	In 5 cases V. =	20/ CC
" 25 " "	20/XXX	" 1 case "	10/CC
" 12 " "	20/XL	" 4 cases "	no report
" 14 " "	20/L	" 3 " "	failure
" 4 " "	20/LXXX		

Cause of vision falling below 20/L. Vision of 20/L after cataract extraction is, I believe, considered a good result.

Cases 22, 33, 43, 67, final vision 20/LXXX. No. 22—Man, age 82, very feeble, projection not good, atrophy of optic nerve. No. 33—Man, age 83, very feeble vision evidently due to some fundus trouble, exact lesion not clear. No. 43—Poor vision caused by slight nebulosity of cornea. No. 67—Young man, age 20, very white cataract. Projection not good. Amblyopic eye. Operated for cosmetic effect.

Cases 2, 16, 21, 84, 94, vision 20/CC. No. 2—Myopic eye. Glaucomatous symptoms developed, resulting in atrophy of nerve. No. 16—Opaque capsule, patient an epileptic, and did not want discission as he could see well enough with other eye. (No. 8 in this series) No. 21—Man, age 32, projection not good, atrophy of optic nerve. No. 84—Man, age 67, feeble. After making incision patient squeezed eye, expelling lens. Syringe not used. Iritis developed. No. 94—Boy, age 15. Eye amblyopic. Operated for cosmetic effect.

Case 34 10/CC. Man, age 66. Increased tension after operation, causing prolapse of iris.

Cases 7, 39, 90, 92, no report. These cases did not return after leaving the hospital. In each case, judging from the appearance and condition of the eye when last seen, I would expect at least 20/XXX vision.

Cases 12, 80, 86, were failures. No. 12—Man, age 45, had a congenital coloboma of iris downwards. The pupil was small and below the centre of the cornea. The cataract was removed through the coloboma, the corneal section of course being down. Iritis developed, resulting in occlusion of pupil. No. 80—Very large woman. Detached retina several weeks after extraction. No. 86—Girl, age 17, congenital opacity of each lens. February 1, 1906, lens removed, combined operation. Following the discission, about three months later, hypopyon keratitis developed, probably due to infection. This is the only case of the series in which there has been any infection, and in this it followed the discission.

NOTES ON TRANSILLUMINATION OF THE EYE.

By Dr. PERCY FRIDENBERG, New York,

JUNIOR SURGEON, N. Y. EYE AND EAR INFIRMARY, ETC.

FOR some time I have been making transillumination a routine measure in ophthalmic examination. The object was to get data as to the reaction, not only of variously diseased but of normal eyes as well, and of the different tissues and structures, to light transmitted from behind the pupil. I have used the instrument of Sachs and that of Wuerdemann, the former in my clinic and that of Dr. Gruening at the New York Eye and Ear Infirmary, the latter in my private practice. I much prefer the Wuerdemann instrument. It is very light, easily managed with one hand, does not heat up, and takes up little space. Where the media are fairly clear the light is quite sufficient. An obstruction to light which is not very dense or thick, as, for instance, a small pigmented tumor, may cast a shadow on examination with this instrument, while intense light from a stronger one would penetrate the mass and mislead the examiner.

The Sachs transilluminator gives a very brilliant beam of light. I have found it valuable in cases where extra illumination was needed, as in dense opacity of the media where there is a slight diminution of brilliancy without actual shadow, and in the combination of this method with ophthalmoscopic examination to be mentioned later.

The brightness of the red reflex which appears on

transillumination in the pupillary area depends to a marked degree on the angle of incidence of the illuminating rays, and also on the angle at which they are seen on emerging by the observer. For this reason we get a better reflex when the illuminating pencil is applied far back near the equator of the globe, and pointed forward toward the anterior segment, than under the opposite conditions.

The observer should look into the pupil in a line with the patient's gaze and not directly from in front as is usually done, unless, of course, the patient is looking straight ahead, in which case the required optical conditions will have been presented. If the patient is looking off to one side, the rays emerging from the eye go off through the pupil at right angles to the plane of the iris and only a small proportion reaches the eye of the observer. The result is a faint fundus reflex which may be incorrectly interpreted and lead to the assumption that there is some intraocular condition interfering with the transmission of light.

Transillumination of the Iris.—In transillumination the normal iris shows the following reaction: The pupillary margin appears as an absolutely opaque, hence black, line. The stroma of the iris is slightly translucent, so that the bright red pupil is surrounded by a zone which is slightly less dark than that corresponding to the sclera. Corresponding to the ciliary attachment there is a narrow zone which is somewhat translucent, so that a faint glow appears about opposite the corneal margin. This gradation of the light permeability of the iris corresponds quite closely to the distribution of pigment in the posterior layer. The latter is markedly thickened at the pupillary margin, and, as is known, occasionally shows nodular excrescences. The translucency of the stroma is never marked. I have not been able to detect any individual variation depending on age or color of the iris, but the number of cases examined is, as yet, too small to allow any conclusions to be drawn.

Influence of the Epithelial Pigment Layer of the Iris on Transillumination.—The pink eyes of the rabbit and of albinos are well known; the appearance being due to lack of the layer of pigment epithelium in the iris allowing light to be irradiated from the depths of the eye. From observations to be detailed farther on, I greatly doubt whether light can penetrate the iris diaphragm, no matter how scanty the stroma pigment, as long as the posterior pigment layer, the pars retinalis iridis, is preserved.

In conditions of atrophy of the iris, transmitted light may show a red reflex in places which appeared opaque by reflection of focal illumination. In this way an optical polycoria may be presented where there is actually but a single anatomical pupil.

In examining a case of atrophy of the iris, recently, I was able to demonstrate that this transparency of the iris when denuded of the pigment layer is most beautifully shown by transillumination. By focal illumination the pupil appeared slightly irregular and somewhat enlarged. By transmitted light (ophthalmoscope), a slightly translucent area was seen above. On transillumination, this entire upper segment of the iris melted away, as it were, and the bright red glow from the pupil now extended to the ciliary border over the entire upper quadrant of the iris, presenting the appearance of a large coloboma.

The rôle of the iris pigment in its action in light-rays and especially its behavior on transillumination is interesting and suggestive. Wuerdemann has shown that it is impossible to transilluminate a globe after even slight intraocular hemorrhage, so that a small amount of hematogenous pigment absorbs a large amount of light. Again, non-pigmented tumors in the interior of the eye do not interfere with transillumination, while those containing pigment cast a shadow and are thus detected. Dense corneal opacities may cause a slight dimming of the red reflex, which appears to be due to the

fact that it is impossible to transilluminate from a point sufficiently far back to prevent some light-rays being lost by reflection and irregular refraction. The same result was noted in a case of subluxated lens with beginning cataractous changes, and can be observed in opacities of the lens, still in situ, if transillumination be made very obliquely. The amount of light thus arrested is, however, comparatively small.

Opacities of the Media.—The effect of cataract, leucoma of the cornea, and of vitreous proliferations on transillumination.

As regards opacities in the media and their effect on transillumination, I have found that corneal deposits have no effect on the light at all. The same holds good of lenticular opacities, and even of mature senile cataract.

Apparently dense structures, such as organized opacities in the vitreous, connective-tissue formations under a detached retina, and even thick, white leucomata, which are quite opaque to oblique illumination on account of their reflecting almost all the incident light, do not materially interfere with transillumination, and allow a bright red fundus glow to appear in the pupil.

In all these cases there is no appreciable diminution of transmitted light. This enables us to apply transillumination where on account of absolutely opaque media we cannot examine the interior of the globe in any other way. It might also be of service in suspected retention, within the globe, of foreign bodies, such as wood or glass, which cannot be detected with the X-ray. In the same way, possibly, a metallic body, if not very far back, could be seen to cast a shadow, even in case of complicating cataract, so that this method might be used to corroborate the findings of radiography or where the latter is not available.

Combination of Transillumination with Ophthalmoscopy.—The examination of the anterior segment of the fundus with the ophthalmoscope is not very satisfactory. This

appears to depend, not so much on the inability of bringing this region into the field of vision, as on the difficulty of illumination. When the mirror is tilted very far to one side, as it must be to get the correct angle, little or no light is thrown on the eye, and of this, again, all rays must pass through the lens very obliquely, if at all. The result is marked dispersion and absorption of light, so that no view is obtained of portions of the retina anterior to the ora serrata.

If these regions be made, as it were, self-luminous by transillumination, the Sachs instrument being applied to the sclera directly over the point to be examined, there will be no difficulty whatsoever from the source just mentioned, and it will be found possible to get a very clear and beautifully brilliant picture of the fundus almost as far forward as the ciliary processes.

I have only just begun to experiment with this combined examination, but believe that it deserves further study and promises interesting and valuable results.

EXPERIMENTS ON THE INFLUENCE OF ULTRA-VIOLET LIGHT ON THE LENS.

By Prof. C. HESS, Wuerzburg.

Translated from Vol. LVII., No. 3, German Edition of these Archives, by Dr. Percy Fridenberg, New York.

(*With 7 Illustrations on Appended Plates XIII.–XIV.*)

THE study indicated in the title was carried out in the summer of 1906 in collaboration with Dr. R. de Moraes. The first experimental studies of the effect of ultra-violet rays upon the lens were carried out by Widmark (1889, 1892) who used a 1200 c.p. arc-light. In one or two cases slight changes were noted in the lens which this author considered "of little significance." Later experiments with an arc-light of 4000 c.p. concentrated by means of two powerful rock-crystal lenses were reported in 1901. Sections of the lenses showed karyokinetic changes and cell proliferation in the epithelium of the lens, in mild cases, while in the more severe ones there was disintegration of the nuclei, destruction of the cells, swelling and partial loss of structure of the anterior layer of lens fibres, with transudation between the capsule and the cortex. These changes were all limited to the pupillary area, except that in one case nuclear changes were found so far toward the periphery that the direct action of light could hardly have come into play. No changes at all were noted after the rays had been led through a solution of quinin sulphate. Widmark intended to prove by these experiments that cataract after lightning stroke was not due, as my studies seemed to show, to the

electric discharge alone, but to the effect of light-rays, particularly the ultra-violet rays. He notes that the experiments may have some bearing on the interpretation of glass-blower's cataract.

Among later observers, Herzog (1903) noted lenticular opacities in rabbits' eyes after exposure to the electric arc. In young rabbits the light had no effect, but in older animals lens opacities developed in three cases; in one case a complete and permanent opacity, during an exposure lasting 2 hours. In two other cases, pearly white opacity with some swelling developed. In one of these, the opacity became less dense within 3 days, and finally disappeared completely. Herzog had carefully excluded ultra-violet rays, and attributes the lens changes solely to the effect of heat rays. Birch-Hirschfeld (1900) saw an opacity develop in the anterior layers of the lens after only one minute exposure to mixed electric light which had been deprived of its heat and ultra-violet rays by water filter.

The other observers, some of whom worked with ultra-violet light of great intensity, had only negative results. Hertel, for instance, examined 26 lenses after prolonged exposure to magnesium spark spectrum (1903) but found no changes whatsoever. Birch-Hirschfeld (*Graefe's Archiv*, vol. 58, p. 505), too, had only negative results. He used a Finsen Dermo light of 3.5 to 4.5 amperes, and exposed the eyes of rabbits for 5 to 10 minutes. Ogneff (1890) used an arc light of 5000–8000 c.p. particularly rich in ultra-violet rays, and found that the lens remained unaffected although marked corneal changes resulted. Strebel used spectral light of iron (6 amperes for 5 minutes) without effect.

This review shows how insufficient our knowledge is in a field which should be of great interest from various points of view. For this reason I have made a new series of experiments, using Schott's uviol mercury vapor lamp, which includes wave lengths of

253$\mu\mu$ or about four-fifths of all available ultra-violet rays. The intensity of the current was uniformly 3–3½ amperes. The animals were exposed at a distance of about 10–20 *cm* from the tube and exposed once or twice for 1–16 hours. The length of the lamp made it possible to expose 6 frogs or guinea-pigs to the light at once. At the distance noted, the temperature did not rise above 20–25° C. No concentration of the light, as for instance by means of a lens, was used in this series, so that there can be no question of a possible action of heat. In almost every case, frogs, guinea-pigs, and rabbits showed extensive and characteristic changes in the epithelium of the lens capsule, so that with comparatively simple apparatus a field of experimental study is opened which is important for many questions besides those of the pathology of the lens.

To prevent closure of the lids in the frogs, the lower lids were removed. This was not found necessary in the guinea-pigs, while the eyes of the rabbits were kept open by fastening small clamps to the skin of the lids. Some time after exposure the eyes were enucleated and hardened in Zenker's solution. Surface and cross-sections were studied of the lens epithelium of about 100 animals.

The changes in the frogs' lens were found to be quite similar to those found in the mammalian lens. Macroscopic examination with the loupe occasionally revealed a faint clouding in the pupillary area of the lens. Microscopic changes indicating degeneration were found after 3–4 hours' exposure on the day after the experiment, and in most cases exposure of 5–6 hours caused destruction of cells. Repeated exposure for several hours produced marked signs of degeneration. These were noted after 48 hours as a result of exposure for only 2–3 hours.

Fig. 1 (frog) shows a comparatively early stage of degeneration, this eye having been exposed for 15 hours and immediately enucleated. Mitotic figures are seen in the

vicinity of dying and dead cells. In this and in even earlier stages the epithelial cells are loosened from the capsule, and fall out in making the section. The capsule corresponding to the pupillary area is entirely devoid of cells, while the peripheral portion covered by the iris shows the normal epithelial cell covering. Fig. 2 of a frog, killed 2 days after an exposure lasting 8 hours, shows advanced degeneration of cells and nuclei in one part of the specimen, and in the adjoining portions peculiar changes, especially of form, in the nuclei of cells with but slight changes, or none, in the protoplasm. It is impossible to state whether these nuclear changes are a direct result of the exposure to the light, or whether they are due merely to the extensive degeneration of neighboring cells, but I have never noted similar changes in the neighborhood of degenerated cells in my experiments on other forms of cataract. Fig. 3, (frog) shows what striking and varied degenerative changes are produced in the nuclei of cells whose protoplasm is but faintly stained at this stage, after long-continued exposure to ultra-violet rays (exposure for 4 hours on 3 successive days. Enucleation 36 hours later). Fig. 4 shows a still more advanced stage of cell destruction. The specimen is that of a frog, exposed twice for 5 hours. In all these eyes a decided but not marked opacity of the cornea had developed. I had expected much more marked changes, considering the effect of even short exposure to light of short wave-length rays. The microscopic changes in the cornea will be considered elsewhere.

After interposing a pane of ordinary glass, not more than 1*mm* thick, between the light source and the eye of the animal, I was not able to detect any degenerative changes whatsoever in the lens, even after prolonged exposure, as for 16 hours uninterruptedly, and in other cases for 10–11 hours, several days in succession. Experiments on animals were made with rabbits and guinea-pigs, a few also on apes. I did not get the impression that

the cells of the lens epithelium of warm-blooded animals were more sensitive to ultra-violet light than those of cold-blooded animals, but the regenerative processes were much more rapid and active. Fig. 5 shows a piece of the lens capsule of a guinea-pig which had been exposed for 15 hours, with peculiar degenerative forms such as I have never seen in any other variety of experimental, or of human, cataract. As a rule, we can only say that cells have been injured or killed off, but here the microscopic examination enabled us to state the nature of the underlying lesion. Fig. 6, of a rabbit's eye, exposed for 6 hours on 2 days in succession, and enucleated 4 days later, deserves further consideration. The upper part of the figure corresponds to the pupillary area, the dark, wall-like zone with closely spaced nuclei representing the region of the iris-margin, as shown in many specimens by remnants of iris-pigment. This wall may appear as a closed ring. This, I think, is due to the fact that the cells about the pupillary area, when exposed to illumination, at first become enlarged and spread out. Neighboring cell groups, which may have become loosened from the capsule by the deleterious effects of the rays, are crowded together, while those of the periphery, protected by the iris, remain more or less unaffected. This wall can hardly be due to regenerative processes, for it is seen at a very early stage, and there are too few mitoses to explain the large number of nuclei. An actual thickening of the cell layer can be seen.

I have not been able to confirm the observations of Herzog, noted above, as to the reaction of animals of various ages. Old and young guinea-pigs showed about the same changes after equal exposure. The degenerative changes already described are followed in warm-blooded animals, after 2–4 days, by a very lively regenerative process, as shown by numerous mitoses (Fig. 7). In many parts of the capsule, every fifth or sixth cell was found to be in a process of division. The

new cells are formed in excess, as usual, and marked proliferation results, with the formation of several epithelial layers.

As to the lens fibres, I have not been able to discover any changes even after prolonged exposure. The rapid clouding of the cornea may have acted as a mechanical protection and thus prevented opacification of the lens fibres.

Widmark attaches importance to the ultra-violet rays in the causation of cataract after lightning stroke, but I have found the pictures of the latter condition so completely different from that due to ultra-violet light that the same cause can hardly be attributed to both. In lightning stroke the mechanical and electrolytic action is so predominant that the effect of the light-rays can hardly be considered separately. The discharge of static electricity in front of the eye causes no changes, even when repeatedly applied, although a part of the rays undoubtedly reaches the lens.

The method described allows us to modify intra-lental metabolism in a very simple way. In massage-cataract we mechanically injure or destroy a certain number of epithelial cells; in naphthalin-cataract the cells are evidently destroyed by poisons which penetrate the lens from without; in exposure to ultra-violet light, short-waved rays probably produce changes within the cells only, which may be interpreted as oxidation and reduction in the protoplasm, although it must be borne in mind that similar changes have been observed after exclusion of oxygen.

Widmark considers the mitoses as a direct result of the illumination, the ultra-violet rays stimulating the process of cell-division, as karyokinetic figures were, with but a single exception, invariably seen only where there was direct action of light. My observations would show that the mitoses are, in the main, part of a regenerative process. In warm-blooded animals I have never

found mitoses without an accompanying and more or less extensive destruction of cells, and this regeneration must depend exclusively on the protected cells after extensive destruction of the cells in the pupillary area.

The question of glass-blower's cataract presents itself in this connection. Repeated destruction of cells in the pupillary area might cause disturbance of nutrition and degenerative changes finally in the peripheral portions of the capsule which were not directly exposed to light, and so cause destruction of the young equatorial lens-fibres which, as we know, are the most easily damaged. In this way opacities might first appear at the equator.

I have shown that all forms of experimental cataract are, in the last analysis, due to a more or less extensive destruction of epithelial cells. This also holds good for the most common form of senile cataract, the subcapsular cortical variety. Glass-blower's cataract may be due to similar causes. Spectroscopic examination of the light employed might clear up matters somewhat. It is known that bottle-blowers are particularly susceptible, and that the green iron-glass used gives out many short-waved rays. The absence of corneal opacities, in marked contrast to the condition noted in experimental cataract, should also be investigated.

Absorption tests showed that in my experiments rays of 300$\mu\mu$ or less were the principally active ones. If glass-blower's cataract is really due to ultra-violet rays, suitable protective glasses will surely be found of prophylactic use.

Continued exposure to medium strong ultra-violet light may also show whether sunlight is a factor, as has been repeatedly assumed, of late, in the causation of various forms of cataract.

EXPLANATION OF ILLUSTRATIONS.

(Figs. 1–4, frog. Fig. 5, guinea-pig. Figs. 6 and 7, rabbit.)
Fig. 1. 15 hours' exposure.

Fig. 2. 8 hours' exposure. Enucleation after 48 hours.
Fig. 3. 4 hours' exposure for 3 successive days. Enucleation after 36 hours.
Fig. 4. 5 hours' exposure, twice.
Fig. 5. 15 hours' exposure.
Fig. 6. 6 hours' exposure, repeated after 8 days. Enucleation 4 days later.
Fig. 7. 6 hours' exposure, repeated next day. Enucleation after 42 hours.
Enlargement—Figs. 1—5 = 500: 1.
Enlargement—Fig. 6 = 120: 1.
Enlargement—Fig. 7 = 350: 1.

CAMPHOR WATER AND CHERRY-LAUREL WATER IN COLLYRIA.

By Dr. J. A. SPALDING, Portland, Me.

IT is doubtful if one physician in a hundred ever thinks of the purity of the medicine which he employs in his practice. I may count myself amongst that number and should have continued in the list, in all probability, for the rest of my life if several patients had not lately complained of the irritating effects produced upon their eyes by the instillation of every-day collyria. Having for years employed camphor water and the water of cherry-laurel in my practice, I was not a little surprised to have my attention called to such old stand-bys as these two prescriptions:

Sodii biboratis 0.30, acidi borici 0.60, aquæ camphoræ 30.00; and the other: sodii biboratis 0.30, aquæ lauro-cerasi 2.00 (vel 4.00), aquæ rosæ 30.00.

Having used these lotions for many years, with comfort to my patients, it was very disagreeable, to say the least, to have so many complaints that a drop or two of either of these lotions instilled into the conjunctival sac produced excessive irritation and flow of tears. Knowing that this was no fault of mine, I talked the matter over with various druggists and found that hardly any of them compounded these medicines in exactly the same manner. Some compounded camphor water by the Pharmacopœia of 1890, and others by that of 1900. Some compounded

laurel water by the Dispensatory, from essential oils, whilst others used nothing but cherry-laurel water as distilled in France, *with a definite percentage of hydrocyanic acid*, and imported in small copper cans similar to those used for other toilet waters.

First as to camphor water. The former way of compounding this was to dissolve an ounce of camphor in an ounce of alcohol and then to dissolve the resultant powder in water with magnesia carbonate. The latest Pharmacopœia uses the same amounts but substitutes talcum, an inferior excipient, in place of the magnesia. But proper directions are not given to insist that after the camphor is mixed with the alcohol the latter should be allowed to evaporate completely before the powder is dissolved in the water. If this is not insisted upon, the camphor water will be irritating to the eyes. It should, additionally, be emphasized, that no such camphor water should ever be allowed to become part of any collyrium until a whole month has elapsed, to get perfect solution of the camphor and talcum.

Now as regards the cherry-laurel water. If this vehicle is simply the imported and distilled water furnished with a small definite percentage of hydrocyanic acid it is free from irritative qualities. But if it is compounded, according to the Dispensatory, from essential oils of bitter almonds, cherry-laurel or peach-pits, the result is much inferior in purity and the irritant qualities are very noticeable.

My purpose in writing this brief note is to urge that unless we, as oculists, desire to accept the blame for prescribing irritating collyria, we must direct our patients to druggists who prepare these prescriptions properly, or we must dispense our own properly prepared lotions, or finally we must complain to the Editors of the standard works in question, urging them to insist on the possibly irritating effects upon the eyes from these two collyria if not exactly prepared and preserved. For it would seem

a matter of regret that medicines of so much comfort to irritated eyes should have to be laid aside owing to differences in preparation, and without some proper substitute at hand.

ABSTRACTS OF ARTICLES IN VOLUME XLVI. OF THE GERMAN EDITION, NOT PREVIOUSLY TRANSLATED.

By Dr. PERCY FRIDENBERG.

I.

THE EYES OF THE BRESLAU MEDICAL STUDENTS.

By Dr. HERMANN COHN.

In 1867 I published a series of examinations of vision and refraction in 410 out of 964 matriculates at the Breslau University. At that time I found 60% of all students to be myopes. A second investigation, in 1880, of 108 medical students showed 59% to be myopic. The last statistics, of 138 medical students, in 1902, show exactly the same, *i.e.*, 60% of myopia, with an average of 3D, as before. Anisometropia was present in 40%. In almost 80% the right eye was more myopic. This confirms Schubert's view that inclined writing, bringing the right eye nearer the page, plays a rôle in this development. Astigmatism was found in 8 cases, 5%. The axis of cylinder glasses worn was not determined. Vision, with correction, was normal, or better, in 90%. (In all three series of statistics, the figures in most cases were obtained by correspondence, comparatively few of the students being actually examined.—P. H. F.) A word about full correction of myopia. A marked change of opinion has recently taken place. Forty years ago, Donders, Graefe, and Arlt, with others, advised full correction for distance only, weaker lenses being prescribed for near work in order not to induce accommodation with consequent increase of

tension and, indirectly, of the myopia; stronger lenses than concave 6D. never being given on account of their diminishing and distorting the image. In 1884 Forster advised full correction in all, even extreme, degrees, and showed that accommodation had absolutely no effect on tension and could not cause any stretching at the posterior pole, but that convergence alone was the active factor, which could be excluded, and the myopia brought to a standstill, by a recession of the far point. He published 68 cases in which full correction had been worn for years, not only without injurious results, but with arrest of the progressive myopia. For near work particularly, he held, full correction was a protection against excess of convergence. I believe it is very difficult to decide whether concave glasses are injurious or not, but the stooping posture in reading and writing with uncorrected myopia, and the consequent disturbance of circulation in the vessels of the head, neck, and, above all, the eyes, are undoubtedly much more deleterious and dangerous as far as progress of the myopia is concerned than a correcting lens. All we can say is that in many cases full correction has done no harm, although myopia has been known to progress in spite of full correction and, again, may come to a standstill in spite of under-correction. In my own case, myopia has progressed in spite of full correction. Many cases are only temporarily progressive, and will not require full correction. Many myopes are uncomfortable with full correction. I do not correct myopia of less than 2D. for reading distance, as they can read comfortably at $\frac{1}{2}$ M, and convergence at this range is not to be feared. Full correction is given for distance. In M, 2–6 D., I prescribe full correction for distance, and a glass about 2D. weaker for near work, such as writing. Full correction should be given for reading, however, in order to prevent bending over. In high degrees of M. it is hard to decide. I advise the choice of a profession which requires less near work. Each case must be corrected on its merits. Convergence is not to be feared, as there is generally insufficiency, and one eye only is used for near work. Decidedly weaker glasses must be given for reading. Myopia is a decided infirmity, and the advantage of a few who are enabled to do near work without presbyopic correction is far out-

weighed by the sufferings of the many whose glasses are lost, broken, or even clouded by accident, not to speak of the danger of progressive myopia and of high degrees with the possibility of serious intraocular disease in later life. Myopia must be prevented or counteracted. The most important detail is the avoidance of excessive convergence. To this end the scholars must be obliged to sit up straight, and the teachers must be constantly on their guard.

II.

THE NORMAL DIMENSIONS OF THE PUPIL AS DETERMINED IN THE POLICLINIC (University of Amsterdam).

By Dr. R. A. TANGE, Surgeon, R. Netherlands Navy.

In 1894, Schirmer reported a series of observations showing that after sufficient adaptation, within 4 minutes, coming from the dark into the light, and *vice versa* in 15 minutes, the size of the pupil is not altered by light intensities between 100 and 1100 meter-candles. This "physiological pupillary dimension" was determined for a large number of subjects, and attention paid to the age, refraction, and color of iris, by Silberkuehl, who found that the pupil has a constant width of *4mm* until the 20th year, and of *3mm* after the 50th, being variable during the intervening years. I have examined 1000 pupils, and arranged them according to age, refraction, and iris color. I find that there is a marked individual difference in the size of the pupil, which is smaller in the male, in hypermetropia, with increased age, while the color of the iris seems to be without influence. Myopes have larger pupils than emmetropes until the age of 20. With increasing age, the differences in the physiological pupillary dimension depending on individual refraction become less marked, and may be neglected after the age of 40. In lowered illumination, the influence of age, sex, and refraction is more clearly marked, and persists until about the age of 60. Accommodation had no direct effect on the measurements. The narrow pupil in hypermetropia may be due to increased tonus of the sphincter resulting from frequent and excessive

accommodation. The narrowing in old age could not be explained in this way. It is probably due to a weakening of the antagonistic dilator, allowing the sphincter alone to determine the size of the pupil. In advanced old age, the pupil becomes very small; probably both dilator and sphincter have lost power, but the preponderance of the sphincter is still sufficient to cause meiosis. (According to this reasoning there should be a widening of the pupil in extreme old age, as against the condition at a time when only the dilator was paralyzed. There is nothing to prove this assumed weakening of the dilator in old age. The well-known rigidity of the pupil in senile eyes makes it seem much more probable that changes in the stroma of the iris, particularly the muscle tissue, are the cause of the narrow pupil.—P. H. F.)

III.

BILATERAL COLOBOMA OF THE CHOROID IN THE MACULAR REGION.

By J. VAN DER HOEVE, Leiden.

So far only 5 cases of this condition have been reported. My case was that of a girl of 11. V. R. and L., 20/120, uncorrected. M, 2D. Both eyes showed a large choroidal defect, about three times the size of the disk, of a dazzling white, almost entirely surrounded by a zone of pigment. The retinal vessels do not run over the defect, which contains rather large trunks of an independent circulatory system which do not form anastomoses. There was an excavation of about 1*mm* in the coloboma. At a slight distance there was a patch of choroidal atrophy, in both eyes. No positive or relative scotoma corresponding to the defect could be made out, so that we must infer the presence of retina in a good functional condition over the defect. There was fairly marked concentric contraction of the field of vision for colors and for white. Pressure on the globe as well as on the carotid and jugular decreased the fulness of the vessels in the coloboma so that they were arterial without a doubt. The macula was at the usual point as shown by good central fixation. It is supposed to be nourished by the chorio-capillaris, which of

course was wanting in this case of coloboma. Good vision in these cases shows that the retinal vessels alone are able to support the macula. As to the causation of this developmental defect, there are a number of theories. Von Ammon believed it due to a failure of the fœtal eye cleft to close, although this presupposes a turn of the entire globe through an angle of 90°, and was disproven by Chievitz. Naumoff explained central coloboma as a residue of choroidal hemorrhages in the newly born. The symmetric occurrence and general appearance are not in favor of this view. Congenital developmental defect, according to Hess, would hardly explain so circumscribed a defect, the presence of a pigmented zone, and the absence of other intraocular anomalies. Intrauterine inflammation is a plausible theory of Deutschmann, supported by the well-known susceptibility of the macula in other diseases (myopia, albuminuria, diabetes) and the fact pointed out by Leber, that serious inflammations in infancy may disappear without leaving any trace. This would be difficult to reconcile with the presence of functionally, if not histologically, normal retina over the coloboma. The presence of punctate opacities in the anterior cortical layers of both lenses speaks in favor of some previous intraocular inflammation. Developmental arrest could not produce lens opacities, as the lens is transparent from the beginning of fœtal life. The coloboma looked very much like a choroiditic scar, especially the pigmentation.

IV.

EXPERIMENTAL INVESTIGATION OF THE INFLUENCE OF INFECTED DRESSINGS ON THE COURSE OF HEALING OF ASEPTIC WOUNDS OF THE GLOBE.

By Dr. A. W. GENTH, Basel.

Within the last ten years there has been a change of opinion as to the importance of an occlusive bandage for the purpose of protection against infection and for immobilization of the globe after major operations. Bach, Marthen, Franke, and others have shown that the normal conjunctival sac generally

contains various species of micro-organisms, and that the secretion of tears and the mechanical action of the movements of the lids play an important part in at least partial sterilization. Experiments have proven that the moist warmth generated by the bandage and the prevention of winking are followed by a decided increase in the bacterial flora. Hjoerth's open-wound treatment was the practical result. The question of the importance of absolute sterility of bandage material for the healing of the operative wound is still an open one, and was made the subject of experimental study in the following manner. Penetrating wounds about 5*mm* long were made with sterilized instruments in the cornea, sclera, and sclero-corneal margin of rabbits' eyes under general anæsthesia. In a number of cases the lens was purposely injured. Immediately after the operation the closed lids were covered with a moist lint pad which had lain for at least 15 minutes in a solution of cyanide of mercury and been expressed with unsterilized hands. Unsterilized cotton-batting was then further contaminated by means of a platinum loop or spatula which had been dipped into a pure culture of pyogenes aureus, streptococcus lanceolatus (pneumococcus), or a mixture of the two, the virulence of which had been established beforehand. In a number of cases the cotton was saturated with a bouillon culture of these germs, and then fastened over the eyelids by means of adhesive plaster strips. In 64 experiments there were only 6 cases of infection of the wound. Considering the exaggerated manner in which the dressings had been contaminated, it would appear that scrupulous care in sterilizing eye dressings is unnecessary. Furthermore the hands were not disinfected, the instruments had merely been placed in cyanide solution, and in 2 cases, the dressings were brushed off by the animals, so that infection may have been due to these factors. It would not be wise to conclude that bandage material need not be sterilized. The experiments merely show that exaggerated care is unnecessary and that infection is not the inevitable result of even grossly contaminated dressings. Instruments must be most carefully sterilized, and as the hands cannot be rendered absolutely sterile, it is important not to have them come in contact with solutions intended for use in eye operations, to keep the instruments

sterile until the moment they are to be used, and to consider them infected after they have once touched the lids or the fluid in the conjunctival sac.

V.

THE QUESTION OF THE SIMPLE OPERATION FOR THE EXTRACTION OF CATARACT.

By Dr. M. KOSLOWSKI, Kiew.

The advocates of the combined operation lay stress on the fact that it is difficult to remove cortical debris and capsular remnants without iridectomy, that secondary operations are more frequent, a larger section, with consequent danger of loss of vitreous, necessary, and the spectre of iris prolapse ever near. The last objection is, in my opinion, the only important one. In regard to preliminary iridectomy, I am opposed to subjecting the cornea twice to the dangers of wound infection, particularly in complicating disease of the conjunctiva or sac, although the procedure may be necessary in complicated cataract. The iridectomy is generally the stage of operation at which accidents are apt to happen; the subsequent extraction being usually very simple. I have collected the statistics of 456 simple and 966 combined operations which I have performed at the Popow Hospital. After a section in the limbus I use a cystitome to produce slight luxation by pressure on the lens,which is then extruded in the usual manner. After removal of cortical masses, the iris, which returns spontaneously in about 30% of all cases, is replaced by irrigation and massage (60%). In the remaining 10%, the iris, which was generally subjected to traumatism, had to be replaced with a spatula or abscised. This latter procedure was needed in only 5% of the cases. The patient is kept absolutely quiet for 6–8 hours after operation, and allowed to sit up on the following day. Iris prolapse took place in 8% of the cases. Immediate excision is the wisest course, and should be performed at operation if the iris is not easily and completely replaced. Early discission, 10 to 12 days after operation, is not dangerous and gives excellent results. It was performed in about 17% of the cases. A comparison of

visual results, partial failures, and post-operative complications shows a small percentage in favor of the simple operation. The technique is undoubtedly less difficult; there is no danger of hemorrhage obscuring the field as it is apt to do in iridectomy.

VI.

A CONTRIBUTION TO THE STUDY OF SQUINT.

By Dr. J. VAN DER HOEVE, Leiden.

A choice of one of the innumerable operative methods devised for the correction of strabismus must be based on a consideration of the advantages and disadvantages of the various types. For the lengthening of a muscle the operations of v. Graefe, Arlt, and Critchett alone are to be considered. Panas's operation—stretching the muscle directly—is excellent in principle but unfortunately requires general narcosis. Recession of the muscle in the capsule (Parinaud) does not produce as much effect as a simple tenotomy. Critchett's subconjunctival method does not allow us to dose the effect exactly nor to divide it evenly. The sinking of the caruncle can be avoided just as well by other means, notably Liebreich's operation, and rapidity of operation and avoidance of infection nowadays pertain equally to all methods. Arlt's method of grasping the muscle with forceps is somewhat more difficult for the beginner than that of Graefe, but it prevents rotation of the globe, allows the tendon to be cut through close to the insertion, and is less painful. The use of sutures for fixing the globe in an over-corrected position after operation has been generally abandoned. In shortening a muscle, preference should be given to procedures which suture the muscle to its natural insertion. Subconjunctival shortening and folding leave objectionable thickening and are difficult to gauge. Scleral suture is not easy to place. The only possible danger in suture of a resected muscle is that of the stitches pulling out. This can be avoided by allowing the muscle to be folded under or by means of a loop suture. An operation of this sort was performed by Dieffenbach and later advised by Schweigger.

VII.

ON EXPERIMENTAL GLAUCOMA.

By Dr. G. ROMBOLOTTI, Milan.

Histological investigations of glaucoma are hampered by the fact that the material is almost invariably old, and that secondary changes have generally taken place which greatly complicate the question and make it almost impossible to decide what is cause and what, effect. Numerous experiments have been made to produce uncomplicated glaucoma in animals' eyes and to get material for histological study, but here, too, it was found difficult to produce a clinical picture similar to that observed in man, although increased tension was easily brought on. The iris angle was the usual point of attack, and ignipuncture, cauterization, limbus wounds, were used to produce obliteration in this region. The injection of irritating insoluble substances to block the filtration angle was unfortunately followed by marked inflammation, so that the glaucoma was probably a secondary complication. Donders's theory that glaucoma is a secretory neurosis led to experiments on the cervical sympathetic by Wagner, Adamuek, Hippel, and others. The results were not decisive.

The lack of experimental investigations on glaucoma secondary to pupillary seclusion, analogous to the clinical observation in dislocated lens, led me to devise means of producing iritis and pupillary adhesions by means of disks introduced into the anterior chamber of rabbits. Celluloid was used for this purpose, allowing the intraocular changes to be followed. After the corneal wound had healed, severe irido-cyclitis developed with parenchymatous keratitis and marked rise of intraocular tension during the entire acute phase of the process. The iris became entirely adherent to the cornea and a membrane was formed in front of the iris as well as in the pupil. The method is attended with a number of technical difficulties, but the results are positive and clinically as well as anatomically uniform.

REPORT OF THE MEETINGS OF THE OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.

By Mr. C. DEVEREUX MARSHALL.

THURSDAY, NOVEMBER 14, 1907. MR. R. MARCUS GUNN, PRESIDENT, IN THE CHAIR.

Mr. J. Herbert Fisher read a paper on **some cases of interstitial keratitis from acquired syphilis.** Before reading notes of four cases which he had personally observed he expressed his surprise that so few instances of interstitial keratitis from acquired syphilis had been brought before the Society; this was the more regrettable seeing that Mr. Jonathan Hutchinson, when vacating the presidential chair, had especially directed the attention of members to this subject as one upon which information might usefully be collected. The text-books dismissed the subject with very brief reference, and gave no authoritative statements as to frequency, date of onset, severity, and prognosis of the disease. After reading notes of his four cases, and alluding to one of corneal inflammation which rapidly followed the primary inoculation of syphilis on the lower eyelid, Mr. Fisher expressed his opinion that interstitial keratitis from acquired syphilis was generally a tertiary manifestation; that it appeared usually to attack only one eye, and that the infiltration frequently limited itself to a portion only of the cornea; that the keratitis, as far as it went, was identical in clinical appearances with that due to inherited disease, and that the statement which had been made by Nuel, that it was usually secondary to irido-choroiditis, was by no means universally

accurate. Mr. Fisher further read notes of a case of interstitial keratitis in the child of a mother who had herself inherited syphilis, and who had in consequence suffered from kerato-iritis, with choroiditis and deafness. The question of the transmission of syphilis to the third generation was raised upon this case: assuming the husband of a woman, who had inherited syphilis, to have acquired syphilis, the point was raised whether she was more, or less, likely than a wife free from inherited taint, to bear syphilitic children to him. Other practical points of discussion were raised, and members were invited to contribute their experiences, in hope that evidence might in time be obtained which would be of guidance both to ophthalmic and general surgeons, in answering the questions which might be addressed to them as to the advisability of marriage by patients who were the subjects either of inherited or of acquired syphilis.

Mr. Thomas Henderson (Nottingham) read a paper on **the anatomy of the so-called ligamentum pectinatum iridis, and its bearing on the physiology and pathology of the eye.** He stated that the so-called pectinate ligament was a part of, and belonged to, the sclera. The principle on which it was constructed was perfectly simple, being exactly the same as that which obtained in the fibres of the neighboring tissue in which it lay, as an open network, composed of non-sclerosed interlacing fibres, which were in direct continuation with the circular and longitudinal bundles of the sclera surrounding the venous sinus of Schlemm's canal. The circular fibres were made out in tangential and transverse sections of the pectinate ligament, while the longitudinal fibres were seen in radial sections. The criterion of a true radial section was that it showed the anatomical connection and continuation, often suggested, but hitherto never yet demonstrated, of the hyaline layer of the ciliary body with the posterior limiting layer of the iris. Arising as a continuation of the innermost lamellae of the cornea, the pectinate ligament could be divided into (1) a small outer or scleral portion, where fibres at the posterior end of Schlemm's canal became lost in those of the sclera, and (2) an inner larger or ciliary division, which could be still further subdivided into (a) a portion which pierced the scleral ring to give attachment to the meridional fibres of the

ciliary muscle, (b) a part which passed internal to the scleral ring to terminate in the connective tissue stroma of the circular portion of the ciliary muscle. None of the fibres of the ligament turned round into the root of the iris, as was described. but this appearance was the result of an oblique section, and emphasized again the importance of studying only true radial preparations. The iris root was attached to the circular bundles of the ligament at a point just posterior to the scleral ring, which attachment to the ligament was quite a different matter to fibres of the ligament being said to bend round into the iris, which they did not. He considered that the term ligamentum pectinatum iridis was thus not only altogether inappropriate, but also wrong and misleading, as in man it was neither a comb-like stucture, nor was it a ligament to the iris. On this account, and because of its reteform or cribriform structure, and further on account of its being a ligament in the true sense of the word to the two portions of the ciliary muscle, the term "cribriform ligament of the ciliary muscle" was much more appropriate. This ligament showed a most marked histological difference in its structure and nature at different periods of life. In youth it was cellular, while as age progressed it became more and more fibrosed. It was this physiological sclerosis, in excess, that he considered was the fundamental *causa causans* of primary glaucoma, in the causation of which two factors must be separated—the one constant, the other accessory. The first and constant factor was sclerosis of the filtration network and a consequent diminished outlet. The second, and variable, agent was vaso-motor in nature, and it was this which determined the acute attack, in which there was superadded to the first an inflow out of proportion to the available and already reduced channels of exit from the eyeball. Viewed in this light, the whole phenomena of glaucoma, clinical and pathological, could be explained. A closer study of this sclerosis of this filtration network gave a clear view of the progress of development and stages of formation of connective tissue, with definite histological proof that white and elastic tissue was not a direct conversion of the cell protoplasm, but was derived indirectly from alteration and transformation of a homogeneous substance which was itself the product of

cellular activity. The alveoli of the filtration network were connected with the lymph spaces of the cornea and sclera, whose fixed corpuscles were brought into direct association with the endothelial cells of the anterior chamber. It was in consequence of this anatomical continuity that the cornea, by diffusion, received its nourishment from the aqueous. This fact would explain a great deal, and would have the utmost bearing on the pathology of corneal diseases.

AN ORDINARY MEETING OF THE SOCIETY WAS HELD ON THURSDAY, JANUARY 30, 1908, MR. R. MARCUS GUNN, PRESIDENT, IN THE CHAIR.

The following card specimens were shown:

Mr. E. E. Henderson: Sections from case of sarcoma developing under calcareous plate.

Mr. P. C. Bardsley: A new form of scotometer.

Mr. S. Stephenson: A case of buphthalmia apparently cured by the performance of iridectomy.

Dr. L. Guthrie and Mr. S. Mayou: Right hemiplegia with obstruction (thrombosis?) of the left common carotid and central artery of the retina, with perception of light in the eye.

Mr. G. H. Goldsmith: Optic neuritis.

Mr. J. S. Horsford: Essential shrinking of the conjunctiva.

Mr. C. Wray: Sympathetic irido-cyclitis.

Papers

Mr. S. Mayou: **Microphthalmia, resembling glioma, with lenticonus and hypertrophy of the ciliary body.**

Mr. Mayou said the case belonged to the class of phthisis bulbi. Some of those cases had been of inflammatory origin, but this, and possibly some of the other cases, were attributable to the imperfect development of the mesoblast, and its entering the ocular cleft to form the vitreous. The child was six months old, and was admitted under Mr. Hancock. The mother had noticed that the left eye was very small from birth, but the child had no other deformities. There were no signs or history pointing to congenital syphilis. The right eye was normal in size, and there was nothing abnormal

in the fundus. In the other eye there was a well marked pupillary membrane. Behind the lens, which was clear, was a yellowish-white reflex, with vessels on it, similar to that seen in glioma and pseudo-glioma. As diagnosis was doubtful, enucleation was performed, and the child made a good recovery. The eye was hardened in formol, and sections cut anteroposteriorly. The optic nerve was removed, and cut in transverse section. The globe measured 15*mm* anteroposteriorly, 10 vertically, and 10 horizontally. The sclera showed no change. The angles of the anterior chamber were imperfectly formed, owing to incomplete separation of the iris from the back of the cornea. The ciliary body was free from signs of inflammation. Behind and lying on the pars plana was a large mass of pigmented and unpigmented cells, derived from the ciliary body. Towards the outer part was an attempt at alveolar formation. The retina was detached, but did not stop at the ora serrata, but passed close behind the ciliary process, where it was continuous with the anterior layer of the epithelial cells and the mass mentioned. The retina was thickened and thrown into folds, and consisted principally of neuroglial tissue, but possessed no regular structure. The retinal detachment was of earlier date than the hæmorrhage. The choroid presented a coloboma below, but the blood vessels were not thickened. The lens showed a condition of posterior lenticonus. The central artery was well developed, and showed no changes in its walls. Generally in such cases the distortion of the posterior part of the lens was associated with a persistent hyaloid artery, or a gap in the posterior part of the lens capsule, but neither of those conditions was present in this case. There was a hypertrophy of pigmented and non-pigmented epithelial cells, the reason of which it was difficult to understand, unless it was due to nutritional disturbance in the line of separation of the two layers in the primary optic vesicle.

Mr. L. Paton read a paper on **optic neutritis in cerebral tumors.** The paper was based on the records of 252 consecutive cases seen at the National Hospital, Queen Square. In 202 of these, the localization of the intracranial tumor was definite, and 148 were confirmed by operation or *post mortem.* Of the 202 cases, 38, or 18.8%, had no neuritis; 12 had only

very slight neuritis, the edges being at no period completely blurred; 27 were in a condition of post-neuritic atrophy when first seen, and the remaining 125 had marked neuritis. Mr. Paton pointed out that the great majority of cases without neuritis occurred in subcortical and pontine tumors. The percentage of cases with no neuritis in tumors of those two areas was, respectively, 38% and 43.5%. He pointed out, further, that when subcortical tumors developed optic neuritis, it almost invariably indicated that the growth had involved either the gray matter of the cortex or the gray matter of the base, and that when pontine tumors developed optic neuritis it, practically without exception, indicated very definite involvement of the cerebellum. He showed that in tumors of the cerebral cortex the intensity of the neuritis seemed to vary inversely with the distance of the tumor from the anterior pole of the middle fossa. He adduced evidence to show that the nature of the growth had little if any influence on the development of optic neuritis, except in so far as the nature of the growth might influence its position. He stated that the figures showed that very little reliance could be placed on differences in the intensity of the neuritis as indicating the side of the tumor, and that in the cases of frontal and of cerebellar tumor, neuritis was just as frequently most marked in the optic disc of the opposite eye as it was in the eye on the side of the tumor. The neuritis commenced more frequently in the eye on the side of the tumor than in the opposite eye, but even here the preponderance—23 to 13—was not sufficiently marked to make the sign one of much value for localizing purposes. He described in detail the development of the macular changes seen in intense cases of tumor neuritis, and showed that these changes were most probably produced by an overflow of œdematous fluid from the much swollen disc into the nerve fibre layer, and that the presence of very well marked macular fans was compatible with the retention of perfectly good vision. The causation of the temporary attacks of blindness, lasting from a few seconds to half an hour, was discussed, and it was shown that these were probably not associated with optic neuritis, as they had been observed three times in cases when no optic neuritis developed, and in other cases these fleeting

amblyopias had occurred before ophthalmoscopic evidences of disc change were present. It was suggested that these attacks were due to sudden rises in intraventricular tension, causing a bulging of the thin floor of the third ventricle, and to direct pressure on the chiasma. The attacks were invariably accompanied by increased headache and giddiness. He pointed out that there was no evidence in favor of optic neuritis in these cases being due to an inflammation descending from the basal meninges, nor was there evidence in favor of its being due to pressure of fluid in the vaginal space. The clinical evidence against it being a descending inflammation in the nerve trunks was even stronger, nor was there any more evidence in favor of the neuritis being produced locally by the action of toxines, or of its being a vaso-motor phenomenon. He regarded our knowledge as yet insufficient to justify any definite theory as to the causation of optic neuritis, but a general review of the subject in its clinical aspects inclined him to the view that in so-called optic neuritis there was simply a manifestation locally of a general œdema of the cerebral tissues, due to the irritation set up by the tumor as an actively-growing foreign body.

The following two papers by Mr. SIMEON SNELL were, in his absence, taken as read:

Carcinoma of orbit originating in meibomian gland. The case occurred in a woman, aet. 63. In 1904 another surgeon had removed a lump from the upper eyelid. In July, 1905, there had been a recurrence at the site of that scar reaching back to the orbit, and about the size of a walnut. This was removed with the portion of eyelid, but in June, 1906, there was another recurrence, and then the eyeball was removed and the whole orbit cleared out, and chloride of zinc paste applied. Still further recurrence had occurred, and the orbit was filled with a large ulcerated growth, and the preauricular and cervical glands were enlarged. Dr. A. E. Barnes reported that it was a spheroidal celled carcinoma, and was of opinion that it had probably originated in a Meibomian gland. Mr. Treacher Collins corroborated this.

The second paper was on **coloboma of iris in each eye,** occurring in 5 generations. Mr. H. was the first person seen, and he had a large coloboma in each eye, down and out. The

defect was known to have existed in his grandmother, in her sister, and in his mother. Mr. H. had 6 children, 3 of whom were affected, and of these, two had children—one 3 children of which 2 were affected, and one 1 child affected. Mr. H. was the only child of his father, but his mother had, by a second husband, 5 children of which three were affected. One of these had 3 children, 2 of whom were affected. The other had 1 child, which was not affected. In all, of 41 persons 12 are affected—5 males, 7 females. In the great-great-grandchildren, the defect was complete aniridia.

CLINICAL EVENING, 13TH FEBRUARY. MR. TREACHER COLLINS, F.R.C.S., VICE-PRESIDENT, IN THE CHAIR.

Mr. L. Paton showed a case of **detachment of the retina treated by operation.** The patient had been sent to the National Hospital for the Paralysed with the diagnosis of double optic neuritis, and the remark that both nasal fields were lost. The right eye had been useless 36 years, and for a year there was mistiness in the left. Vision was then 3/60, now it was 6/18. To get at the main point of detachment, he trephined above the tendon of the external rectus, and pulled the eye well forward by a tenotomy hook under the external rectus. He cauterised through the sclera until the subretinal fluid escaped, and aspirated the rest with a lachrymal syringe. He then perforated the retina above and below. In the middle of January the field was quite full. Mr. Hosford showed a case of buphthalmia with malformation of the iris, and the causation of the condition was discussed. Dr. F. W. Edridge-Green gave a lantern demonstration on some primary facts of color-perception, and an interesting discussion eventuated in a resolution being passed, on the proposition of Mr. C. D. Marshall, that a committee of the Society be appointed to go into the question of color-blindness and the tests for its detection, and report to the Society. Mr. Lang seconded the proposition. Mr. Marshall asserted that the present tests failed in many instances, and that Holmgren's test could not be relied upon. Mr. J. F. Cunningham showed an orbital case for diagnosis. It was thought to be apical periostitis, or caries of the apex of the orbit, or an

optic nerve tumor. Mr. J. H. Fisher showed a patient with microphthalmia, and a case of fundus changes resulting from injury at birth. The second of these patients was born with great difficulty, and there was a huge hæmatoma of the left frontal region, and soft tissues in the right temple and orbit were much damaged and lacerated by forceps. Possibly the optic nerve was damaged, and there was hemorrhage from the lacerated vessels into the hyaloid canal, and that this formed the basis for the connective tissue organization. He did not think there was any shrinking of the globe. Mr. Bardsley showed a case of retinitis proliferans. A large bundle of connective tissue came forward into the vitreous. He regarded it as congenital, as there was a large detachment of the retina, and only a very small field. There was no history of injury, either at birth or since, but the eye had been defective as long as the parents could remember. Mr. C. Wray showed a case of follicular conjunctivitis, which he considered to be perfectly curable. It was contagious, and among 1,400 children in the Croydon schools there were 12 cases of the condition. Mr. Parsons showed a patient the subject of a condition which he thought was probably metastatic neuroretinitis. A woman had a glistening mass of exudate over the left disc, with considerable swelling, and some hemorrhages on the disc. Then she suddenly lost the sight of that eye. The exudate diminished, leaving a glistening white star resembling that seen in albuminuric retinitis. She had no albuminuria.

REPORT OF MEETINGS OF THE SECTION ON OPHTHALMOLOGY OF THE NEW YORK ACADEMY OF MEDICINE.

By Dr. H. W. WOOTTON, Secretary.

MONDAY, JANUARY 20, 1908.

Dr. W. E. Lambert was elected chairman, and Dr. H. W. Wootton was re-elected secretary for the ensuing year.

Present, 32 members.

Dr. J. E. Weeks presented a number of cases of simple glaucoma on which he had performed iridectomy after the method of Lagrange (*Arch. d'ophtalmologie*, 1906, and *The Ophthalmoscope*, Sept., 1907), which has for its object the formation of a permanent filtration cicatrix. One eye was operated on in each of two patients; both eyes in each of two patients. Broad iridectomies were performed, the wound lying well in the iris angle. An œdematous condition of the conjunctiva lying over the defect in the sclera was present in four of the eyes, more marked in some than in others. The tension was normal at the time of the presentation in all but one eye, in which it equalled T + ½. One case had been under observation three months since the operation. The most recent case had been operated upon five weeks previously. The condition in all of the cases was very favorable. None had been under observation long enough to enable Dr. Weeks to decide regarding the durability of the filtration. In view of the tendency for a gradual firm closure of wounds of this nature, it is not wise to draw conclusions until a large number of cases can be observed for a long period of time. Dr. Weeks stated that the operation impressed him

very favorably and that he should continue to employ it in suitable cases.

Drs. E. B. Coburn and Mortimer Warren presented a case of **phlyctenular eye disease treated with tuberculin**.

The patient, a girl aged twelve, was first seen by Dr. Coburn in the Eye Department, Cornell University Medical College Dispensary, on June 9, 1905. She was pale, badly nourished, and undersized and was found to be suffering from enlarged cervical glands and trachoma with pannus. Expression was employed and under appropriate after-treatment the trachoma was cured. Soon afterwards the cervical glands were removed in the Surgical Department. From that time to May, 1907, she came at several and irregular intervals with phlyctenular eye disease. Each attack disappeared slowly under treatment, but left corneal scars. On the last date she was found to have cervical adenitis again and was referred to Dr. Warren for tuberculin treatment. Tuberculin, T. R., was given by Deny's method in decimal dilution, increasing each dose by 1/10. The initial dose was 0.0000001*cc* and the highest 0.0001*cc*. Fourteen injections were made twice weekly for two weeks, then fourteen more once a week. The opsonic index was taken and only followed in a general way, and not as Wright has indicated. Injections were omitted twice when the index remained low. During this time the eyes have cleared up and been free from disease and the patient's general appearance, color, weight, and size have greatly improved. The enlarged cervical glands have diminished in size.

In the discussion of Dr. Weeks's cases, Dr. J. H. Claiborne thought that they were excellent examples of iridectomies with the section made far back in the sclera; he doubted whether the method of Lagrange was any better than the ordinary method with the section made far back. Dr. E. L. Oatman had performed the operation of cyclo-dialysis in one case with a good result, and liked it. He had not tried Lagrange's method. The operation of cyclo-dialysis was easy and had given no reaction to speak of. Dr. E. L. Meierhof thought Lagrange's method particularly useful when the anterior chamber was very shallow. By using a Graefe knife in these cases one obtained a larger section than with

the keratome. Dr. W. B. Marple thought that a narrow Graefe knife could be used in any case of glaucoma instead of the keratome, and that it should be used if the anterior chamber were very shallow. Whether the filtration scar produced by Lagrange's method would continue to be serviceable indefinitely remained to be seen. Dr. Weeks in closing replied that he nearly always used a Graefe knife in glaucoma, and when the anterior chamber was very shallow he thought it always should be used. He believed in iridectomy in all cases of simple glaucoma.

In the discussion of Drs. Coburn's and Warren's case, Dr. W. B. Johnson asked whether the glandular tissue removed from the neck had been examined microscopically and bacteriologically.

Dr. Weeks asked how the opsonic index had been determined in Dr. Coburn's case. Phlyctenular keratitis, in his opinion, could not be tuberculous. It was an eczematous process and staphylococci were invariably found. Dr. E. L. Oatman stated that nearly all cases had some disturbance of the digestive apparatus and the treatment of this accelerated the cure. Most of the cases were underfed, and were great tea drinkers. He did not believe they were tuberculous. Dr. Coburn, in reply to Dr. Johnson, stated that the glands were removed three years ago, and were not examined bacteriologically. In regard to treatment as shown by this case, the amount of tuberculin used should be so small as to give no marked reaction. Dr. Mortimer Warren stated that the opsonic index in this case had been determined before the injections, but that it had not been used as a subsequent guide. Dr. Weeks stated that the opsonic index in the same individual showed great variations in a very short time.

Dr. Arnold Knapp presented a patient in whom, after the use of the **ophthalmo-reaction** of **Calmette** in a previously healthy eye a typical **tuberculous keratitis** set in. (Published in full in These Archives xxxvii. 2.)

In the discussion of Dr. Knapp's case Dr. Duane stated that in one case in which he used fresh Calmette's serum there had been a moderate injection of the conjunctiva and some mucous secretion, and that this increased to a regular follicular conjunctivitis in five or six days. From then on,

tuberculin injections had given a typical reaction and the patient was under regular tuberculin treatment. This experience with Calmette's serum was not satisfactory, to say the least. Dr. M. L. Foster stated that he had had no bad results from Calmette's test. The second instillation appeared to be the dangerous one, but, from what others had observed, Calmette's test was not entirely free from danger. Dr. Knapp, in closing, stated that the preparation which he had used had been supplied by Dr. W. H. Park, of the Department of Health, and that only one instillation had been employed.

Dr. J. E. Weeks reported a case of **foreign body in the globe.**

Dr. H. W. Wootton read a paper entitled **The final results in the extraction of senile cataract**, which completed the symposium on cataract held during the year. The paper was, for the greater part, statistical, and derived from the well-known literature on the subject. The writer had occasion to speak favorably of extraction by means of preliminary iridectomy. He believed that a valid plea for its re-introduction and more general employment could be established on the ground that it was not so likely to be followed by iritis and irido-cyclitis. This he believed to be due to the fact that the cut edges of the iris had healed by the time extraction was undertaken, and did not present so ready a surface to infection or to irritation by swollen lens fragments as do the recently cut surfaces of the iris in the combined method or the fresh ruptures of the sphincter which are so apt to occur when extraction is performed without iridectomy. As iritis and irido-cyclitis are the cause of the greater number of our losses and bad results, he thought that the above statement was a very important point in favor of extraction by means of preliminary iridectomy.

In dealing with sympathetic ophthalmia following extraction, he reported a case operated upon by him in 1902 in Drs. Pomeroy's and Hepburn's clinic at the Manhattan Eye and Ear Hospital. The lens was immature and evacuation incomplete. Violent irido-cyclitis followed and, on the fourteenth day, the pupil of the unoperated eye became sluggish and, with a typical picture of irido-cyclitis, the unoperated eye became painlessly blind, and underweut

atrophy in about a year. The short time (fourteen days) elapsing between the primary irido-cyclitis and the secondary may raise some doubt in regard to the character of the latter. The patient (a woman) was the mother of thirteen children. There was no history of syphilis, and anti-syphilitic and anti-rheumatic treatment was entirely without results. It seemed impossible to ascribe the case to any cause other than sympathetic.

MONDAY, FEBRUARY 17, 1908. DR. W. E. LAMBERT, PRESIDENT, IN THE CHAIR.

Present, 42 members.

Dr. W. M. CARHART presented a case of **toxic amblyopia from wood alcohol.**

Three days before admission to the Manhattan Eye, Ear, and Throat Hospital, the patient was shellacking beer vats, as he had been doing for three weeks, having to get into the interior of the vats to do the work. Not feeling well, he stopped work during the afternoon, and went home. The next morning, just after breakfast, he was seized with an attack of vomiting, but went to work in spite of this. While at work he had to come out on account of another vomiting spell, and went home to bed. That night, when he wished to get up, he found he could not find his way about the room. The next morning he could barely distinguish moving shadows, and applied at the Manhattan Eye, Ear, and Throat Hospital.

On admission, both pupils were dilated and did not react to light. Vision faint, light perception left eye, none in right eye.

By the ophthalmoscope, swelling of upper and lower edges of both discs with exudate covering the vessels of the retina both above and below the discs. Vessels tortuous, but not reduced in size; in fact, they were engorged over the entire retina, so far as the observer could follow them.

The patient was admitted to the ward, put to bed, and treatment at once started. His bowels were freely moved with calomel, magnesium sulphate, etc., and hot packs applied, until profuse diaphoresis resulted on the second day. Leeches were also applied to both mastoids several times. On December 10th, iodide of potash was started in saturated solution,

ten drops, increasing one drop each day up to thirty-six drops per dose. On December 14th, strychnin sulphate was started hypodermically, 1/50 gr., increasing 1/100 daily. At 14/100 the physiological effects of strychnin were apparent and the dose was dropped to 12/100, and not increased daily until January 6th, when the dose was again increased daily as before up to 19/100. On February 5th the strychnin was stopped for five days, and resumed at 10/100 dose up to the present date. During his first week in the hospital dionin 5% was instilled, and also eserin, in the right eye, but with no apparent effect.

For ten days the patient remained totally blind, and four days after admission the exudate seemed increasing, the margins of the discs less discernible above, below, and to the nasal side in the right eye, but less change in the left eye.

On December 12th the discs seemed to be somewhat clearer, especially the left one, and on December 15th the margins of both discs were much better defined. On that date the left eye perceived moving shadows. Improvement continued, until December 20th O.S. counts fingers at 6 inches, and field of vision above and to the temporal side fair. The next day, O. D. perception of light in strong illumination. January 1, exudate gone from both fundi. Vision O. D. fingers at 8 inches; O. S. fingers at two feet. Present vision, O. D. moving shadows, fingers; O. S. 3/200.

Dr. Arnold Knapp presented a patient with **symmetrical peripheric ectasia of the corneæ.**

E. F., forty-four years old, has always had poor sight. From her fifteenth to twenty-second year the eyes were inflamed and painful at intervals. During this period she was treated by Prof. Horner in Zürich, who, the patient remembers, considered her case as very unusual. The sight in the left eye remained poor, the right improved; she thinks that her sight has failed during the past year. Her health otherwise has been good. She has had six children.

The peripheric part of both corneæ is ectatic; this bulging is limited to the upper and inner quadrants, that is, symmetrical. This part of the cornea is clearly thinned out and transparent; is crescentic in shape, and measures 3.5*mm* in the broadest part; its junction with the normal cornea is

marked by an opacity which is sharply limited centrally, and is prolonged at each extremity of the crescent into the normal cornea.

The vision is R.w—1.—5. c 40°N = 2 0/50. Fundus normal. L.w—1.—5. c. 40° N = 20/200.

A number of articles have recently appeared in the *Klin. Monatsbl. f. Augenh'lk.* on this corneal condition and the literature on the subject can there be found. It seems that the formation of a groove precedes the ectasia and that the change may be inflammatory or simply degenerative. In this case an inflammatory condition presumably in the nature of marginal keratitis came first, though the symmetry of the lesion is striking.

In the discussion, Dr. David Webster stated that the condition of the fundus in Dr. Carhart's case was interesting. He had seen several cases of toxic amblyopia from wood alcohol, but this was the first that had begun with an optic neuritis; all the others had been cases of simple atrophy. In the beginning the discs were decidedly red and the margins obscured, except that in the horizontal meridian on both sides of the disc the appearance was normal. It was also extraordinary that the vessels were of good size. The long continuation of the total blindness, with subsequent recovery of some vision, was also striking. The case would have been treated by the so-called process of "choking" had he not already had an optic neuritis. It is to be expected that, as the atrophy advances, the patient will lose what vision he has. The large size of the field was also remarkable.

Dr. E. L. Oatman stated that Dr. W. A. Holden had shown that in these cases the loss of vision was due to the death of the ganglion cells of the retina. In Holden's cases, the vessels were never enlarged. In Dr. Carhart's case, he did not think the neuritis had been very extensive, otherwise the vessels would, at the present time, be smaller.

In the discussion of Dr. Knapp's case, Dr. David Webster asked whether it might not be a case of kerato-globus. Dr. W. E. Lambert thought that in kerato-globus more of the periphery would be involved. Dr. Arnold Knapp stated that the literature explained these cases by assuming that they

followed peripheric keratitis or that, in other cases, they originated from an extension of an arcus senilis.

Dr. ALEXANDER DUANE read a paper entitled **When and how shall we use cycloplegics in refraction work?** It was based partly on a continuous experience of twenty-one years with cycloplegics, partly on systematic examinations in 140 cases made recently by Dr. J. B. Thomas and himself to determine the precise way in which homatropin acts. After detailing the way in which these tests were conducted, he summarized his results as follows: 1. It is impossible in most cases to make an accurate determination of the refraction without a cycloplegic. 2. It is not sufficient to be content with an approximate determination, such as we get when a cycloplegic is not used, for (a) the true amount of astigmatism found under a cycloplegic often differs appreciably from the manifest astigmatism found beforehand; (b) the amount of latent error unmasked by the cycloplegic may differ in the two eyes, so that a correction that relieved simply the manifest error would be relatively too strong for one eye or too weak for the other; (c) we often fail to relieve the symptoms if we correct simply the astigmatism and the manifest hyperopia; (d) without a cycloplegic we fail to get the best results from the most valuable of our objective tests, skiascopy. 3. It is even more important to use a cycloplegic in adults than in children, and especially in adults between 40 and 45—in fact, he finds it necessary to use it up to and in some cases beyond the age of 48. A table was given of nineteen cases in which a large amount of refractive error was present after the age of 40. 4. Homatropin, if properly used, is generally a satisfactory cycloplegic. The few cases in which it fails to produce adequate cycloplegia are marked by varying vision and varying acceptances, discrepancy between the subjective tests and the skiascopic findings, and the persistence of a range of accommodation of 1 D or more as determined by actual measurement. In such cases, homatropin should be tried a little longer, and if this still works unsatisfactorily we should use atropin, which, however, is not always effective either. 5. The method of using homatropin that he has found best is to instill a 2% solution of the hydrobromide every 10 minutes, making at least three and usually four instillations,

although many people will require five, six, or even seven. Complete cycloplegia is rarely produced in less than an hour, usually in from one and one-quarter to one and three-quarters hours, and some cases require over two hours. Owing to this variation in action, no case should be finally tested for glasses under the cycloplegic until a determination of the near and far points (brought sufficiently near the eye by the use of a suitable convex glass) shows that the range of accommodation is as near zero as possible. 6. Homatropin, if administered with proper precautions, is a safe cycloplegic. Considering the enormous frequency with which the drug is used, the cases in which it excites an attack of glaucoma are extremely rare, and they are generally avoidable. Other unpleasant by-effects are usually trivial. Homatropin, if used in the manner advised, produces a rather more prolonged effect than is generally admitted. 7. Some interesting by-results have been noted in the experiments, especially (a) the wide variations from Donders's curve that have been found in taking the accommodation of 160 persons whose precise refractive state was known; (b) the not unusual occurrence of unequal accommodative power in the two eyes; (c) the large range of accommodation often found in myopes.

In the dicussion of Dr. Duane's paper, Dr. David Webster thought that we generally could get along without cycloplegics. It was his practice to give the patient a glass that made him comfortable. He tested the distant vision first and then estimated the astigmatism by means of the ophthalmometer. If the patient could see better with the astigmatic correction he prescribed it; if he could not see better, he did not prescribe it. Dr. Francis Valk thought that if a man knew how to use his instruments properly and could draw proper conclusions, it was not necessary for him to employ cycloplegics. The fitting of glasses was a matter of experience, and the more experience one had, the less need there was for cycloplegics. In children, of course, he employed atropin a good deal.

Dr. David Webster stated that he did not use cycloplegics once in fifty cases. When he had employed them in young persons, he did so to find out the exact bottom refraction, but except in cases of convergent strabismus he did not prescribe until the patient had recovered from the cycloplegic.

Dr. Linn Emerson was in accord with everything that Dr. Duane had said. He was not able himself to fit glasses properly without the aid of cycloplegics, and the correction of small errors was of the greatest importance. He had even diagnosed the existence of spinal curvature and the direction of the curvature correctly from the examination of the eyes. He usually employed homatropin with cocain. He always instilled eserin afterwards, which restored the accommodation more rapidly, and avoided the risk of glaucoma. He used homatropin, regardless of the age of the patient. In only twenty per cent. of the cases in which he employed cycloplegics did he find no astigmatism, and the correction of slight degrees of astigmatism was of the greatest importance.

Dr. W. B. Marple stated that his practice was identical with that of Dr. Duane. He had had one case of glaucoma from the employment of one drop of a homatropin solution. The glaucoma was not relieved by miotics and required iridectomy. A few years afterwards the patient had glaucoma in the other eye, although no cycloplegics had been employed. Homatropin was often contaminated with atropin.

Dr. E. S. Thomson stated that he employed cycloplegics whenever he considered them necessary, but that he did not feel that he always required a total estimation. There was undoubtedly a partial contraction of the ciliary muscle, which resulted in astigmatism of the lens. It was unwise to crowd the full correction in such cases.

Dr. Arnold Knapp asked how Dr. Duane determined quickly whether the accommodation was fully relaxed.

Dr. H. H. Tyson stated that for years he had employed pilocarpin after the use of cyploplegics. Otherwise, he was in accord with Dr. Duane.

Dr. M. L. Foster said that by any method one would have a certain number of failures and successes. He had employed homatropin a great deal and had found a number of cases in which the accommodation had not only not been paralyzed by it, but had even been stimulated. He had never seen but one case of spasm of accommodation overcome by homatropin.

Dr. Alexander Duane had not found the use of eserin or pilocarpin afterwards very satisfactory. It often made the

patient more uncomfortable. The frequency of glaucoma had been overestimated, and those that did develop it would do so anyway. In determining whether complete relaxation had been produced, he first put on the patient's full correction; then added, say a + 2, and determined whether, at a distance of half a meter exactly, the patient could distinctly see a fine hair line. If the line could still be seen at any considerable distance inside or outside of half a meter, he concluded that the accommodation had not been entirely paralyzed.

Dr. E. B. Coburn read a paper entitled **Report of a case of traumatic rupture of Descemet's membrane, with remarks on defect of that membrane.**

A man, about twenty-five years old, received an injury to the right eye by a blow from a fist. The lids were discolored and a subconjunctival hemorrhage was observed below the cornea. By reflected light a number of fine, double-contoured lines were observed in the deep layers of the cornea. The pupillary reaction and fundus examination were normal. Vision was unimpaired. A diagnosis of "multiple rupture of Descemet's membrane" was made. Four days later, the subconjunctival ecchymosis had nearly disappeared and the lines in the cornea could no longer be discovered. So far as the writer is aware, this is the first case of the kind reported from external violence, not due to obstetrical trauma. The cases may be classified as follows :

Defects of Descemet's Membrane
- 1. Mechanical
  - External violence
    - Natal (obstetrical).
    - Post-natal.
  - Internal (intraocular) pressure.
- 2. Inflammatory.
- 3. Maldevelopment.

1. Ruptures have been observed in cases of high myopia, keratoconus, megalo-cornea, primary glaucoma and glaucoma secondary to intraocular tumors (usually gliomata), hydrophthalmos, and after obstetrical injuries. The characteristics of these ruptures are the presence of fine, double-contoured lines in the deep layers of the cornea. They are usually pointed, and are frequently parallel. Corneal opacity usually results, if the endothelium is disturbed. These cases are closely related to folds in Descemet's membrane; to small, complete ruptures of the cornea, and so-called "spontaneous

rupture of the cornea." Blood pigment in the cornea usually finds entrance through these fissures. Obstetrical injuries frequently cause these opacities, and when observed later may be mistaken for congenital leucomata. The cause is usually increased intraocular pressure with stretching of the cornea. These defects are usually observed in young persons. They have been reported by only twenty writers and seem to occur most frequently in cases of hydrophthalmos. Acute cases may recover in a few days, though they may last for years. The symptomatology is practically nil, giving rise to distinct clinical symptoms only in cases of keratoconus, with pain, sudden impairment of sight, and with or without local ectasia of the cornea. In cases of myopia, high degrees of astigmatism have been attributed to these ruptures. The gap in the lamina vitrea may be open, may be covered with endothelial cells, or the gap may be filled with new vitreous membrane. This condition has been produced experimentally. Certain cases may be stained with fluorescin. Bowman's membrane may also be ruptured, without affecting the overlying epithelium. The treatment is median tarsorrhaphy or a compression bandage, with pilocarpin or eserin. Certain cases of corneal opacity and interstitial keratitis are accompanied by defects in Descemet's membrane and its lining endothelium. Maldevelopment resulting in non-formation of the anterior chamber may prevent the formation of Descemet's membrane.

In the discussion of Dr. Coburn's paper, Dr. Arnold Knapp asked how long the fissure had lasted. Dr. Coburn replied that the fissure had disappeared in four days. Dr. Arnold Knapp thought that if the fissure had been due to a rupture of Descemet's membrane, it would have been permanent.

Dr. T. R. Chambers read a paper entitled **Improved yellow oxide of mercury ointment.**

This ointment has been and will continue to be a most universally employed medication, the world over. It is recommended in all the works on diseases of the eye. It is thus a very important factor in our armamentorium.

It has always proved very efficient, but has one great drawback, so serious that some individuals have preferred the disease to the pain of this salve.

Without going into the details of the different experiments which I have tried to eliminate this unfortunate feature of pain, I asked the aid of the laboratory of Parke, Davis & Company. The following notes are by and from their chemist. Any chemist may accomplish like results.

The yellow oxide of mercury is prepared as follows:

Mercuric chloride corrosive	25 grammes
Sodium hydrate	10 grammes
Distilled water	q. s.

Instructions:—Dissolve the mercuric chloride in 250*c.c.* of warm distilled water and filter. Dissolve the sodium hydrate in 250*c.c.* of cold water. Pour the mercuric chloride solution slowly into the sodium hydrate solution. Allow this mixture to stand for one hour at a temperature of about 30° C. and agitate frequently. Decant the supernatant liquid from the precipitate. Wash the precipitate with distilled water until free from caustic soda.

(The following test may be applied in order to determine if the last traces of caustic soda have been removed from the precipitate. A portion of the washings when poured into a little mercuric chloride test solution no longer produces a yellowish turbidity.)

The U. S. Pharmacopeia directs "Dry as nearly as possible the precipitated yellow oxide of mercury by utilizing a suction funnel."

Just here is the change recommended in this paper: The precipitate, a moist magma, *is simply placed on a cloth strainer and allowed to drain.*

Parke, Davis & Company, continuing, say "The results we obtained show conclusively that if the moist magma is simply placed on a strainer and the precipitate allowed to drain, it cannot be mixed with petrolatum and produce a satisfactory ointment, since, as you are well aware, vaseline will not take up any appreciable amount of water.

"In our endeavor to produce a smooth and uniform ointment which would be acceptable to you, we incorporated with the moist yellow oxide of mercury, which was washed on a cloth strainer, an equal amount of lanolin anhydrous, and then incorporated two parts of white petrolatum.

"In making this ointment it is, of course, necessary to avoid the use of metal containers, spatulas, etc."

If our druggists will keep some of this stock ointment on hand, of which four grains roughly represent one grain of yellow oxide of mercury, they can in a minute prepare any strength of ointment desired and the result will be constant: a smooth, uniform, elegant, and effective ointment which has the added virtue of being painless.

Whereas, by the old method of simply mixing the grain or two of the dried yellow oxide with an ounce of vaseline, even if a drop or two of oil were used, it requires twenty minutes of rubbing to obtain a smooth ointment which, after all, under a low power, shows its granular condition. The reason for this is that, when once the oxide is dried, it is impossible to restore the amorphous magma condition,—hence the granules seen under the microscope, which are the cause of the pain when placed on a sensitive conjunctiva.

Theoretically, the unguent, freed of its granular condition, should be less painful than when the granules are present. Practically, I am able to record that individuals who found the old formula too painful to use, register no objection to the improved style.

SYSTEMATIC REPORT ON THE PROGRESS OF OPHTHALMOLOGY IN THE FIRST QUARTER OF THE YEAR 1907

By Dr. G. Abelsdorff, in Berlin; Prof. St. Bernheimer, in Innsbruck; Dr. O. Brecht, Prof. R. Greeff, Prof. C. Horstmann, and Dr. R. Schweigger, in Berlin; with the Assistance of Prof. A. Alling, New Haven; Prof. E. Berger, Paris; Prof. Cirincione, Genoa; Dr. Dalén, Stockholm; Prof. Hirschmann, Charcow; Dr. J. Jitta, Amsterdam; Mr. C. Devereux Marshall, London; Dr. H. Meyer, Brandenburg; Dr. P. von Mittelstadt, Metz; Dr. H. Schultz, Berlin; Prof. Da Gama Pinto, Lisbon; and Others.

Translated by Dr. Matthias Lanckton Foster.

Sections XIII–XVIII. Reviewed by Dr. NICOLAI, Berlin.

XIII.—LENS.

81. Freytag, G. **Concerning the lens with double focus.** *Muenchener med. Wochenschr.*, 1907, No. 7.

82. Czermak. **Pseudophakia fibrosa, a fibrous false lens developed from the tunica vasculosa lentis.** *Arch. f. Augenheilk.*, lvii., No. 2, p. 79.

83. De Lapersonne. **Zonular cataract.** *Ophtalm. provinciale*, Jan. 1907.

84. Natanson, Sr. **Absorption of the capsule after an atypical operation for cataract in a child.** *Moskauer augenaerztl. Gesellsch.*, Nov. 28, 1906.

85. Lubowski, E. **Technique of discission of secondary cataract.** *Klin. Monatsbl. f. Augenheilkunde*, xlv., No. 1, p. 366.

86. Moretti, E. **Hooked needle for discission or lance-shaped synechotome.** *Archives d'ophtalmologie*, xxvii., No. 1, p. 25.

Freytag (81, **Concerning the lens with double focus**), in order to explain the phenomenon of the lens with a double focus, instituted experiments with the lenses of animals placed

in fluids which produced cataract in part and did not in part. He used water, salt solution, egg albumen, alcohol, formalin, olive oil, xylol, and glycerine. Certain fluids, such as glycerine, find difficulty in penetrating the inner part of the lens. While such a differentiation between the cortex and the nucleus is possible it must be remembered that an optical differentiation is also possible in the human lens without the production of opacity because the nucleus is of greater refractive strength than the peripheral portions of the cortex. In the light of these experiments the picture of the lens in lente appears as an affection sui generis.

From the notes left by Czermak (82, **Pseudophakia fibrosa, a fibrous false lens developed from the tunica vasculosa lentis**) Ulbrich reports the following interesting case. A man 24 years old presented the following condition. Right eye, nystagmus, weakness of vision, distorted pupil. Left eye photophobia, conjunctivitis, very small eyeball turned inward, movable with difficulty, cornea defective, anterior chamber deep, iris atrophic and vascular, pupil fixed, crater-like, tension elevated, amaurosis. The eye was enucleated. The preparation revealed a very rare and interesting organ-like formation in the place of the lens which had probably become absorbed in consequence of proliferation of the tunica vasculosa. This lens-like formation was fibrous and attached on all sides to vessels which came from the iris and vitreous. The case was one of a congenital malformation, not aphakia congenita, but rather of pseudophakia congenita fibrosa. Ulbrich adds an account of the few cases met with in literature.

De Lapersonne (83, **Zonular cataract**) discusses the influence of heredity in zonular cataract, which is doubtless the etiology. Cases are quoted and the question is asked whether it does not furnish sufficient ground for advice against marriage. A girl with the affection becomes married, two children are born with the same disease, the third dies of tuberculous meningitis. Berger.

Natanson (84, **Absorption of the capsule after an atypical operation for cataract in a child**) saw in a child 2½ years old the lenses after discission appear in the anterior chamber on both sides. After the lenses were extracted the capsules

gradually melted away so that the pupils were free and black at the end of a week. Augstein and Ginsberg reported a similar case in 1896. The author thinks that the complete abolition of the normal connections of the lenticular system is a necessary condition for the resorption of the lens.

HIRSCHMANN.

LUBOWSKI (85, **Technique of discission of secondary cataract**) makes a peripheral incision in the lateral margin of the cornea 2 or 3*mm* long, allows the aqueous to escape, introduces Stilling's harpoon, or a cystotome, divides the membrane and withdraws. Aseptic dressing. The apertures are permanent. No bad after-effects have been noticed.

MORETTI (86, **Hooked needle for discission, or lance-shaped synechotome**) has devised an instrument for the discission of secondary cataract which consists of a sharp, slender lance, the surface of which is perforated and presents on its margin a hook-like curvature. Its use prevents the formation of a large wound, lessens danger of infection, avoids the escape of much aqueous, while its manipulation is simple and easy. The instrument can also be used for the division of anterior and posterior synechiæ.

BERGER.

XIV.—IRIS.

87. VAN DUYSE. **Incomplete aniridia (rudimentary iris).** *Archives d'ophtalmologie*, xxvii., p. 1.

88. NATANSON, SR. **Anomalies of the iris.** *Moskauer augenaerztl. Gesellsch.*, Dec. 19, 1906.

89. HUMMELSHEIM. **Studies of the pupil. 1. Does the pupil contract concentrically?** *Arch. f. Augenheilkunde*, lvii., No. 1, p. 33.

90. ROCH, MAURICE. **Persistent hippus coincident with inequality of the pupils and vasomotor troubles of the face.** *Archives d'ophtalmologie*, xxvii., p. 164.

91. BUMKE. **Relations between lesions of the cervical cord and reflex immobility of the pupils.** *Klin. Monatsbl. f. Augenheilkunde*, xlv., No. 1, p. 257.

92. ROLLET and AURAND. **Experimental comparative study concerning tuberculosis and aspergillary pseudotuberculosis of the choroid.** *Revue générale d'ophtalmologie*, xxvi., No. 1, p. 1.

93. CHIARINI. **Contribution to the study of the epithelial tumors of the iris and choroid.** Eighteenth meeting of the Italian Ophthalmological Society, Oct. 11, 1906.

94. Speciale-Cirincione. **Bits of stone in the iris.** *Zeitschrift f. Augenheilkunde*, xvii., No. 2, p. 143.

95. Cuperus (Zwolle). **Softening of the cornea in iridocyclitis.** *Med. Tydschrift voor Geneeskunde*, 1907, No. 4.

van Duyse [87, **Incomplete aniridia (rudimentary iris)**] examined anatomically a case of incomplete aniridia and found the following changes. 1. Fontana's space and the ligamentum pectinatum iridis were greatly developed, as in a fœtus of from 7 to 9 months and in many mammals. 2. Absence of the sphincter and dilator pupillæ. As these muscles start in the fourth month the operating cause of the aniridia seems to be present before this developmental epoch. 3. Degeneration of the vessels of the uveal tract. The last explains the frequent occurrence and the unfavorable prognosis of glaucoma in irideremia.

Natanson (88, **Anomalies of the iris**) describes a rare anomaly of the iris, which he met with in the glaucomatous eye of a woman 53 years of age. The obliquely oval pupil was displaced downward and outward, while the iris presented nine large total defects that were taken to be atypical colobomata. The anomaly was taken to be congenital and not to be related to the glaucoma.

Hummelsheim (89, **Does the pupil contract concentrically?**) made some experiments with an apparatus constructed by Hess and found in 160 eyes that the pupil contracts and dilates concentrically. He was unable to confirm the displacements of the pupil observed by Grossmann in the astigmatic eye.

Roch (90, **Persistent hippus coincident with inequality of the pupils and vasomotor troubles of the face**) observed in a woman 67 years of age the existence of a distinct hippus, particularly on one side, myosis was present on the other, which persisted for three years. At the same time vasomotor and ocular symptoms were present which were referable to paresis of the right and irritation of the left sympathetic.

Berger.

The question whether the pathological causes for reflex rigidity of the pupil are to be sought in the cervical spinal cord has often been discussed. Bumke (91, **Relations between lesions of the cervical cord and reflex immobility of the**

pupils) contributes the investigation of thirty-seven cases of progressive paralysis. The light rigidity is rarely isolated in the spastic form of the paralysis, its origin is most likely of tabetic nature. Yet one always finds in tabes in addition to the degeneration of the posterior columns cerebral changes, atrophy of the optic nerves, etc. Bach saw the pupillary reaction preserved when the spinal cord had been severed from the after-brain, but his experiments on animals are not transferable to man. Reichardt has tried to prove that the Argyll-Robertson symptom is caused by a characteristic degeneration in the upper part of the cervical cord. But many objections have been raised which give the results of investigations that unequivocally do not support this hypothesis. The theory that the material cause of the rigidity of the pupil lies in the cervical cord remains unproven, even though the negative evidence that no cause is to be found in the brain is so often advanced. The question remains unsolved. The investigations of the author direct the attention back to the older theory that the disturbance is of cerebral origin, in or below the reflex arch in the region of the corpora quadrigemina.

The similarity in the conditions of tuberculosis and aspergillosis of the lungs led to comparative experimental studies to determine whether this analogy was also present in the deep membranes of the eye. Rollet and Aurand (92, **Experimental comparative study concerning tuberculosis and aspergillary pseudotuberculosis of the choroid**) introduced masses of tuberculous material and spores of aspergilli into a rabbit's eye with aseptic precautions through an opening in the sclera and so produced a direct inoculation of the choroid and an indirect one through the vitreous. The results were as follows: The tuberculosis appeared usually in the form of small, isolated, round or oval elementary granulations without a margin of pigment, less often as a disseminated choroiditis or chorioretinitis. The pseudotuberculosis produced by the aspergilli showed miliary nodules in the choroid, similar in form and appearance to the tuberculous nodules. The course is more stormy with the pseudotuberculosis, the foci develop into irregular, many formed surfaces; the slowly growing tuberculous nodules generally retain their form. The tuberculosis spreads into the anterior segment

of the uvea in contrast to the pseudotuberculosis, and has an unfavorable course through generalization and the formation of metastases, but may result in cicatrization and healing. The pseudotuberculosis due to aspergilli may retrogress without great cicatrization and so run a comparatively favorable course. After indirect inoculation through the vitreous the tuberculosis runs a similar course, while on the contrary the pseudotuberculosis runs a very severe course under the guise of an iridochoroiditis, retinitis, and serious disturbances of nutrition, even to complete atrophy of the eyeball. BERGER.

CHIARINI (93, **Contribution to the study of the epithelial tumors of the iris and choroid**) reports two cases of metastatic cancer, one in the iris as a metastasis of a cancer of the lungs, the other a metastasis in the chorioid.

SPECIALE-CIRINCIONE (94, **Bits of stone in the iris**) experimentally placed bits of stone in the iris under different conditions and observed the reaction of the eye. When a severe reaction was produced by these bits of stone he found it to be due not to their chemical, physical, or bacterial qualities, but that its basis was a certain diathesis of the body. The iris is by its structure, its spongy tissue, its abundance of blood and lymph vessels, particularly fitted to be sensitive to changes in the blood plasma, as there is in the eye a predisposition to metastases based on anatomical and physiological grounds. The degree of reaction of the iris to the bits of stone is in accordance with the kind of diathesis, while a sound eye can retain the fragments after a moderate irritation without subsequent trouble. The extraction is to be performed without injury to the iris.

CUPERUS (95, **Softening of the cornea in iridocyclitis**) mentions several cases in which the cornea underwent a more or less marked softening in consequence of iridocyclitis. He insists that simple iritis without complications on the part of the ciliary body does not exist and that the vitreous and cornea are frequently affected. The corneal disturbance is commonly evidenced by a thickening and a striated opacity. JITTA.

XV.—CHOROID.

96. KNAPP, P. **A rare ophthalmoscopic condition (sclerosis**

choroidæ circinata). *Klin. Monatsbl. f. Augenheilkunde*, xlv., No. 1, p. 171.

97. DE SCHWEINITZ, G. E., and HOSMER, C. M. **Melanotic flat sarcoma of the choroid with unusual clinical symptoms.** *Ophth. Record*, Jan. 1907.

98. MELLER, J. **A case of angioma of the choroid.** *Zeitschrift f. Augenheilkunde*, xvii., p. 50.

99. FISCHER. **Post-operative detachment of the choroid after iridectomy for glaucoma.** *Arch. f. Augenheilkunde*, lvii, No. 1, p. 60.

100. ROLLET and AURAND. **Experimental comparative study concerning tuberculosis and aspergillary pseudotuberculosis of the choroid.** *Revue générale d'ophtalmologie*, xxvi., 1907, p. 1.

The vision of an eleven-year-old girl became bad. Nothing of importance could be learned from the history aside from a distant consanguinity between the parents. P. KNAPP [96, **A rare ophthalmoscopic condition (sclerosis choroidæ circinata)**] found functional weakness of vision and hemeralopia, atrophic discoloration of the papilla, thin retinal vessels, white discoloration of the retina about the papilla, atrophy of the pigment epithelium with prominent choroidal vessels and sclerosis of the same on the nasal side. The vision improved somewhat after subconjunctival injections of a solution of 4% sodium chloride, 2% sodium iodide, together with subcutaneous injections of strychnin.

The noteworthy feature of the case reported by DE SCHWEINITZ and HOSMER (97, **Melanotic flat sarcoma of the choroid with unusual clinical symptoms**) was the repeated attacks of neuralgic pain, œdema of the lids, and localized œdema of the bulbar conjunctiva with injection of the overlying superficial vessels. The œdema was probably due to closure of the venæ vorticosæ. A satisfactory demonstration of the tumor was obtained by the Sach's lamp. ALLING.

MELLER (98, **A case of angioma of the choroid**) describes histologically the condition of an eye which had been enucleated on account of a tumor of the choroid. The first stage, until the increase of tension, lasted five years. Photopsia was a constant accompaniment of the decrease in vision. The tumor was covered by a layer of epithelial formation which had originated from proliferation of the pigment epithelium, a peculiar variety which is seldom observed.

There are nine cases of angioma of the choroid reported in literature.

Fischer (99, **Post-operative detachment of the choroid after iridectomy for glaucoma**) adds a new case to the fifteen which have been already reported of detachment of the choroid after iridectomy for glaucoma. The enucleated eye was examined microscopically. There was a retrochoroidal hemorrhage which might be explained by the sudden diminution of tension. The loss of vitreous usually observed during the operation prior to the bleeding also affords space for the hemorrhage. The inflammation found present in the reported cases had etiologically nothing to do with the hemorrhage and the detachment of the choroid. Of the sixteen reported cases of detachment of the choroid after iridectomy for glaucoma twelve ran a favorable course, in four the eyes were enucleated and examined pathologically. In all four hemorrhage was present.

Rollet and Aurand (100, **Experimental comparative study concerning tuberculosis and aspergillary pseudotuberculosis of the choroid**) have produced changes in rabbits by the inoculation of aspergillus flavus and aspergillus fumigatus which resemble the tuberculosis caused by Koch's bacilli. The pseudotuberculosis of the choroid produced by aspergillus can heal spontaneously in from $1\frac{1}{2}$ to 4 months without leaving behind any serious lesions. The authors observed in the healed eyes a loss of pigment which affected only small places in the retina. While the aspergillus inoculated into the choroid ran a relatively benign course injections of aspergillus into the vitreous induced very serious changes, an iridochoroiditis and retinitis with secondary dystrophic formation of cataract and frequently phthisis bulbi.

XVI.—VITREOUS.

101. Possek, R. **Concerning the antigenetic action of the vitreous.** *Klin. Monatsblaetter f. Augenheilkunde*, xlv., No. 1, p. 329.

At the end of his article Possek (101, **Concerning the antigenetic action of the vitreous**) presents the following summary of the results of his experiments. The vitreous contains receptors of the second order; an immune serum,

originating from vitreous injections, precipitates in homologous vitreous fluids, also in homologous blood serum and contains hæmolytic amboceptors. Thus the albuminoid bodies of the vitreous belong in the same group with blood serum of the same kind, with the erythrocytes and with vitreous albumin of a different kind.

The eye tends greatly to metastasis, on the one hand because of its vascularity and extensive lymphatic system, on the other hand because of its manifold relations to the nervous system. In this relation clinical observations are of just as much interest as pathological investigations; the former frequently have an overshadowing importance in the diagnosis and prognosis. In the endeavor to bring eye diseases into closer relations with general diseases so that the clinical picture of disease may be as it were framed and correctly judged, practically valuable observations are often made the knowledge of which is of use not to ophthalmologists alone.

XVII.—GLAUCOMA.

102. Hirschberg, J., and Ginsberg, S. **Anatomical investigation of a rare case of simple glaucoma of twenty years' standing.** *Centralbl. f. prakt. Augenheilkunde*, xxxi, p. 1.

103. Schulze, Ernst. **Concerning the influence of Bier's cervical stasis upon the intraocular tension.** *Zeitsch. f. Augenh.*, xvii., p. 222.

104. de Vries. **Occlusion of the angle of the anterior chamber in glaucoma.** Twenty-seventh meeting of the *Niederlaend. Ophth. Gesellsch.* Utrecht, 1906.

105. Logetschnikow, S. **Cyclodialysis according to Heine.** *Report of the Ophthalmological Society of Moscow*, Oct. 31, 1906.

106. Boldt. **Recent experiences with cyclodialysis.** *Beitraege zur Augenheilkunde*, No. 68, p. 53.

107. May. **Keratitis punctata and glaucoma.** *Zeitschrift f. Augenheilk.*, xii., p. 309.

108. Czermak. **Technique of iridectomy for glaucoma.** *Prager med. Wochenschrift.*, 1906, No. 24.

109. Lagrange. **A new method of treatment of simple chronic glaucoma by a combination of iridectomy and sclerectomy.** *Soc. d'opht. de Paris*, 1907.

The differentiation of non-inflammatory simple glaucoma from that associated with irritation and inflammation is not always clear from a clinical standpoint. This is proven by a case reported by Hirschberg and Ginsberg (102,

Anatomical investigation of a rare case of simple glaucoma of twenty years' standing) in which a simple increase of tension that had lasted twenty years assumed the inflammatory form and resulted in enucleation. The patient had been under constant medical observation and had habitually used physostigmin drops which, in a sterile solution, had never caused irritation. After nineteen years without special cause and while under the effect of the physostigmin, redness, venous stasis, corneal haziness, pain, dilation of the pupil, and increase of intraocular tension appeared. The pathological examination confirmed the clinical picture.

SCHULZE (103, **Concerning the influence of Bier's cervical stasis upon the intraocular tension**) undertook experiments with cervical stasis of shorter and longer duration on hypotonic eyes and finally on men in order to investigate its action. Exophthalmos, chemosis, and hyperæmia of the inner vessels, contradictory to Wessely's experiment, were produced. The variations in tension were measured by means of Fick's tonometer. In general according to these experiments cervical stasis does not surpass the methods hitherto employed for the purpose of producing hyperæmia. Increase of tension accompanied stasis from suction, together with appearance of albuminoid bodies in the aqueous. The value of this method is not yet proven and needs further investigation.

DE VRIES (104, **Occlusion of the angle of the anterior chamber in glaucoma**) found the angle of the anterior chamber closed in 24 glaucomatous eyes which he examined microscopically. Some showed signs of inflammation. The degrees of occlusion varied. JITTA.

LOGETSCHNIKOW (105, **Cyclodialysis according to Heine**) reports five cases and claims as advantages of cyclodialysis the slight painfulness, the reduction of tension and the absence of bad after-results. He uses a scalpel. HIRSCHMANN.

BOLDT (106, **Recent experiences with cyclodialysis**) reports from Deutschmann's clinic 38 cases of cyclodialysis performed according to Heine's technique. In 12 there were small hemorrhages into the anterior chamber, in three dialysis of the iris, in 13 a prolonged condition of irritation. Small peripheral detachments of the choroid were possibly caused,

but they had no special influence. No retinal detachments took place. In thirty-one the results were more or less good, in six they were bad. In many of the cases the period of observation has been short and in many cases a final bad result is still possible because in glaucoma prolonged observation is necessary. In general cyclodialysis may be said to be indicated in the prodromal stage, as a preliminary to iridectomy in acute and subacute glaucoma, in simple and in chronic inflammatory glaucoma, in hemorrhagic glaucoma, in glaucoma of myopes, in juvenile glaucoma and when luxation of the lens is present as a complication. Reported experiences thus far are very wavering, the last work of Krauss holds cyclodialysis to be an operation unsuited for glaucoma, but further experience should be awaited, especially as iridectomy and other methods do not always produce the desired results.

May (107, **Keratitis punctata and glaucoma**) rightly says that the diagnosis is difficult in the complication of keratitis punctata and glaucoma, but it is important that it should be made because of the question of treatment, whether to use atropin or eserin. In the three cases reported glaucoma was complicated with iritis serosa, kerato-iritis, and cyclitis. In all there were deposits on the posterior surface, or in the deeper parts of the cornea. The affection is usually met with in young girls and is possibly dependent on disturbances of menstruation. The visual fields remained normal. The course is usually favorable .

In acute glaucoma Czermak (108, **Technique of iridectomy for glaucoma**) uses for iridectomy a bellied scalpel and enlarges with scissors. In the cases in which the iris had already become adherent he has performed cyclodialysis as recommended by Heine without permanent result, also as an operation precedent to an iridectomy and finally had combined the two operations into one. Further results with these modifications must be awaited.

Lagrange (109, **A new method of treatment of simple chronic glaucoma by a combination of iridectomy and sclerectomy**) recommends iridectomy with sclerectomy and the formation of a filtration scar in simple chronic glaucoma after observation of five cases. Berger.

XVIII.—SYMPATHETIC OPHTHALMIA.

110. Bellinzona. **Sympathetic ophthalmia.** Eighteenth meeting of the Italian ophthalmological society, Rome, Oct. 12, 1906.

111. Brons. **The clinical picture and the serum treatment of sympathetic ophthalmia.** *Verein Freiburger Aerzte*, June 28, 1906.

112. Sulzer. **Sympathetic ophthalmia, 37 years after the injury.** *Soc. d'ophtalmologie de Paris*, Jan. 4, 1907.

Bellinzona (110, **Sympathetic ophthalmia**) gives the following figures regarding sympathetic ophthalmia. 45 cases among 3500 patients, 1.38%; 28 were caused by traumatism, 15 by infectious ulcer of the cornea, 1 by sarcoma, 1 by an artificial eye. 26 were cases of sympathetic irritation, 19 of inflammation. Papillo-retinitis was present in none. In one case the disease made its first appearance 45 years after the injury.

Brons (111, **The clinical picture and the serum treatment of sympathetic ophthalmia**) failed to obtain a good result from serum treatment in two suitable cases of sympathetic ophthalmia.

Sulzer (112, **Sympathetic ophthalmia 37 years after the injury**) observed sympathetic disease of an eye, iridocyclitis with opacities of the vitreous, 37 years after the other eye had been wounded with a pair of scissors and had become atrophic. Under these conditions he considers it advisable to enucleate an atrophic eye after traumatism. Berger.

Sections XIX.–XXII. Reviewed by Dr. H. MEYER, Brandenburg.

XIX.—RETINA AND FUNCTIONAL DISTURBANCES.

113. Mueller, B. **795 cases of congenital amblyopia.** *Zeitschrift f. Augenheilkunde*, xvii., p. 25.

114. Stadtfeldt, A. **A case of embolism of the superior artery of the macula.** *Ref. Hospitalstid*, 1906, p. 596.

115. Verhoeff. **Occlusion of the central artery of the retina.** *Arch. f. Ophthalmologie*, lxvi., p. 1.

116. Koellner. H. **Investigations concerning the color disturbance in detachment of the retina.** *Zeitschrift f. Augenheilkunde*, xvii., p. 234.

117. Propokenko, P. **The influence of the full correction of myopia upon the frequency of the occurrence of spontaneous detachment of the retina.** *Westn. Ophth.*, 1906, No. 6.

118. Neese, E. **Two cases of intraocular tumors in atrophic eyes.** *Westn. Ophth.*, 1907, No. 1.

Mueller (113, **795 cases of congenital amblyopia**) has collated 795 cases of congenital amblyopia under different headings, such as unilaterality, combination with albinism, refraction, association with conus, and holds that all cases should be considered amblyopic in which the vision is less than half with no explanatory cause to be detected. He confirms the frequent coincident observation of amblyopia, conus downward, and astigmatism. Mueller agrees with Szili's view that this astigmatism is caused by the bulging outward of the wall of the globe in the part corresponding to the conus.

Stadfeldt (114, **A case of embolism of the superior artery of the macula**) found at the first examination the entire macula surrounded by a circle of little hemorrhages. Three weeks later had become partially absorbed, but little white spots had formed between them. The patient was found to have albuminuria on two occasions and Stadtfeldt believes this to have been the active etiological factor.

Hellgren.

Verhoeff (115, **Occlusion of the central artery of the retina**) reports two cases of so-called thrombosis of the central retinal vein together with a precise histological examination. From this together with the analysis of 39 cases taken from the literature, among which 13 were found with the vein not occluded, the author draws the following conclusions: Complete occlusion of the central vein of the retina, with the classic ophthalmoscopic picture of thrombosis of this vessel, can be brought about by an endophlebitis proliferans without thrombosis. The proliferation may affect the sub-endothelial tissue alone, or the occlusion may be rendered complete by an active proliferation of the endothelium within the lumen. All pathologically examined cases in which the occlusion of the central vein of the retina was ascribed to a non-septic thrombosis can be explained as cases of endophlebitis proliferans and were probably caused by that disease. The so-called canalized thrombus of the central vein of the retina is in fact an aneurysm. In certain cases the occlusion of the central vein of the retina gives rise to an attack of acute glaucoma.

Koellner (116, **Investigations concerning the color disturbance in detachment of the retina**) examined 26 cases of detachment of the retina and found, with the aid of Nagel's color equalizing apparatus, that in 88 to 90% disturbances were present in the form of a tritanopia or blue yellow blindness. The color disturbance was usually central and independent of the defect in the visual field produced by the detachment. The tritanopic color disturbance comes into consideration but rarely in the early diagnosis of detachment. On account of the almost always central and often isolated appearance of the tritanopia we are obliged to assume the presence of an exudation in the macula, which has a special vulnerability, ascribed by Krueckmann, to its peculiar anatomical construction.

To decide the question whether and in what sense the full correction of myopia influences the occurrence of spontaneous detachment of the retina Prokopenko (117, **The influence of the full correction of myopia upon the frequency of the occurrence of spontaneous detachment of the retina**) reviews the material obtained in Charkow's clinic. In only 40 clinical cases and in 5 of his own were the statements concerning the degree of correction sufficiently complete to be of value. The author also gives a fairly exhaustive review of the literature in regard to the theories of the origin of retinal detachments in myopia and mentions that the distribution of the elastic tissue in the ciliary body described by him favors the theory of Rochon-Duvigneaud that the accommodation improves the nutrition of the media of the eye by regulation of the movement of fluids within it. He considers that the results of his investigations contradict the theory of Mocquard and Panas that a tension of the choroid cannot be produced by accommodative strain on account of its firm connection with the sclera by means of the lamina fusca. Out of 42 cases the myopia was less than 13 D in 27, greater than 13 D in 15. Glasses were worn in only 20 cases, in only two full correction, in one over-correction. Investigation of a larger amount of material is necessary to answer the questions raised by the author. Hirschmann.

In one case reported by Neese (118, **Two cases of intraocular tumors in atrophic eyes**) the diagnosis of glioma was

made by him and by some of his colleagues and immediate enucleation advised, but doubt was expressed by others because the eye presented the picture of iridocyclitis terminating in atrophy, and they made the diagnosis of a collection of pus in the deep part of the eye, or a pseudoglioma, after an acute disease with brain symptoms, which the child had suffered from. The enucleation was postponed. The tension of the eye was never increased. The eye protruded sometimes more sometimes less from the orbit. The microscopic examination of the enucleated eye revealed an unquestioned glioma with large necrotic spots, necrobiosis, and at the same time extensive inflammation of the choroid, iris, and ciliary body resulting in marked cicatrical degeneration and contraction. The author classifies this case among the cryptogliomata and urges the need of immediate enucleation not only when the diagnosis of glioma is not doubtful but also in all suspicious cases in which this diagnosis cannot be positively excluded.

Second case. An intraocular tumor with severe glaucomatous attacks and subsequent temporary atrophy of the eyeball in an aged woman from whose right breast a tumor had been removed six years before. The microscopic examination showed that the tumor was an alveolar sarcoma of melanotic character. It could not be determined whether this was a primary growth within the eye or a metastasis from the tumor formerly existing in the breast.

HIRSCHMANN.

XX.—OPTIC NERVE.

119. BERNHARD, M. **The presence and importance of medullated nerve fibres in the human retina from a neurological standpoint.** *Berliner klin. Wochenschrift*, 1907, No. 5.

120. GILBERT, W. **Contribution to the pathological anatomy of congenital coloboma of the eyeball with special reference to the optic nerve.** *Arch. f. Ophthalmologie*, lxv., p. 185.

121. VAN DE HOEVE. **Coloboma of the entrance of the optic nerve with normal vision.** *Arch. f. Augenheilkunde*, lvii., p. 13.

BERNHARD (119, **The presence and importance of medullated nerve fibres in the human retina from a neurological standpoint**) maintains with the publication of the cases observed by himself of development of medullated nerve fibres the

standpoint that these are associated with relative frequency with general neuroses. He takes Hippel's position, that it is not the medullated nerve fibres themselves which are congenital, but only the predisposition to their development. The development of the cribriform plate of the ethmoid has the definitive effect upon the development of the medullated nerve fibres.

GILBERT (120, **Contribution to the pathological anatomy of congenital coloboma of the eyeball with special reference to the optic nerve**) reports two cases of microphthalmos with coloboma of the optic nerve which have a bearing on the theory of the origin of coloboma. Both were examined microscopically. In the first case the persistence of a mesodermal tissue was demonstrated in the trunk of the optic nerve below the central vessels, which with the penetrating vessels formed a hindrance to the closure of the cleft. In the second case there was a coloboma of the iris, ciliary body, and choroid, high myopia, great dilatation of the space between the sheaths below, absence of the nerve fibres in the lowermost fifth of the optic nerve, cyclitis, and hæmophthalmos. According to Gilbert a distinction must still be made between aplasia of the optic nerve with coloboma of the globe and true coloboma of the optic nerve. In the second case aplasia in Elschnig's sense appeared to be present confined to the lowermost portion of the otherwise normal nerve together with a typical coloboma of the retina and choroid. In the first case, with the true coloboma of the optic nerve, there was a primary defect in the optic nerve itself caused by an interference with the closure of the invaginated pedicle of the optic vesicle. The cause of the interference is given as an abnormally developed mesoderm in the fœtal optic groove.

VAN DER HOEVE (121, **Coloboma of the entrance of the optic nerve with normal vision**) discovered a case of this nature in which there was a coloboma of the iris, lens, and choroid of the left eye with a vision of $\frac{1}{10}$. In the right eye the vision of which was perfect, the following condition was observed. In the place of the papilla was a white spot partially surrounded by pigment which in turn was surrounded by a partially atrophic choroideal ring. The spot was as large as nine papillæ. The vessels disappeared fairly regularly,

part at the margin of the white spot, part into its deeper portion. The visual field for white was normal, that for colors contracted below. Microcornea on each side. At the end of the article the various theories in regard to the etiology are considered.

XXI.—INJURIES, FOREIGN BODIES, PARASITES.

122. Laroyenne and Moreau. **Three cases of fracture of the skull with probable fracture of the optic canal.** *Rev. gén. d'opht.*, xxvi., p. 97.

123. Bock, Emil. **Foreign bodies encysted in the iris and causing no irritation in an otherwise normal eye.** *Centrlbl. f. Augenh.*, xxxi., p. 66.

124. Schwarz, O. **Detachment of the retina eight years after perforating injury.** *Zeitschrift f. Augenheilkunde*, xvii., p. 54.

125. Noyes, G. L. **Report of a case of self-enucleation of the eyeball.** *Ophthalmic Record*, March, 1907.

126. Cramer, E. **Cause and clinical significance of glass blowers' cataract.** *Klin. Monatsbl. f. Augenheilkunde*, xlv., No. 1, p. 41.

Laroyenne and Moreau (122, **Three cases of fracture of the skull with probable fracture of the optic canal**) observed in Prof. Rollet's clinic three cases of visual disturbance after fracture of the skull in which an involvement of the optic canal was considered probable. In the first case there was an optic neuritis on each side, which recovered with impaired vision on one side but went on to optic atrophy on the other. In the second case there was a choked disk in one eye which resulted in optic atrophy and amaurosis. In the third case, one of gunshot injury, there were amaurosis, exophthalmos, and paralysis of the superior rectus of the left side with hemiplegia and hemianæsthesia on the right side. Berger.

Bock (123, **Foreign bodies encysted in the iris and causing no irritation in an otherwise normal eye**) has had for years under observation two patients, one of whom has a piece of coal, the other piece of wood encysted in the anterior surface of the iris. The place of entrance can no longer be seen in either patient, and only a local inflammation was produced by the foreign bodies.

Schwarz (124, **Detachment of the retina eight years after perforating injury**) describes a case in which a perforating wound and contusion of the ciliary body was caused by a

foreign body. The wound healed and the paresis of accommodation eventually disappeared. Eight years later the retina became detached, an accident ascribed to the bruising of the ciliary body and the subsequent cicatricial contraction. The author recommends a guarded prognosis in cases of such injuries, *i.e.*, when followed by a paresis of accommodation.

Noyes (125, **Report of a case of self-enucleation of the eyeball**) tells of an insane woman who forced her eye out with her fingers, bringing with it about *3cm* of the optic nerve. As far as is known there are only four cases of complete self-enucleation on record. Alling.

Cramer (126, **Cause and clinical signification of glass blowers' cataract**) reports his own observations together with the different theories concerning the origin of glass blowers' cataract. First this form of cataract is monolateral and occurs only among the bottle blowers, not among the plate blowers. It is almost regularly associated with pigment deposits in the skin of the zygoma. This combination indicates that we have to deal with an action of the ultraviolet and not the heat rays. Cramer upholds this view and recommends for the protection of the workmen the placing of cases filled with red colored water before the openings of the ovens. He notes that according to his observation Foerster's trituration causes an abnormal swelling of the lens by bursting of the capsule.

XXII.—OCULAR LESIONS IN GENERAL DISEASES.

127. Sänger, A. **Palliative trepanation in cases of inoperable tumors of the brain for the avoidance of threatened blindness.** *Klin. Monatsblaetter f. Augenheilkunde*, xlv., No. 1, p. 145.

128. Soques. **A case of alexia, or verbal blindness, with autopsy,** *Sec. med. des Hopitaux*, Paris, March 1, 1907.

129. Lazarew, A. S. **Amaurotic family idiocy.** *Wratsch. Gaz.* 1907, Nos. 1–2.

130. Ach, Alwin. **Paralyses of the ocular muscles after lumbar anæsthesia.** *Muenchener medicin. Wochenschrift*, 1907, p. 612.

131. Koenig, Ed. **Peripheral optic neuritis. Surgical treatment.** *Recueil d'ophtalmologie*, xxix., p. 273.

132. Lundsgaard, K. **Hypermetropia in diabetes mellitus.** *Zeitschrift f. Augenheilkunde*, xvii., p. 156.

133. Raimondi. **Double amblyopia with optic perineuritis occasioned by absorption of thyroid gland.** *Recueil d'ophtalmologie*, xxix., p. 168.

134. Scholtz, K. **Statistics of tobacco and alcohol amblyopia.** *Klin. Monatsbl. f. Augenheilkunde*, xlv., No. 1, p. 187.

135. Tojoda. **Two cases of chronic toxic amblyopia with transient complete blindness not due to the tobacco-alcohol intoxication, together with autopsy.** *Klin. Monatsbl. f. Augenheilkunde*, xlv., No. 1, p. 178.

Sänger (127, **Palliative trepanation in cases of inoperable tumors of the brain for the avoidance of threatened blindness**) has performed a palliative trepanation in 19 cases of brain tumor and concludes from his observations that trepanation is much to be preferred to lumbar puncture and that it should be performed as early as possible in order to guard against threatened blindness. The author recommends the region over the right parietal lobes as the site of the trepanation in those cases in which an exact localization of the tumor cannot be made.

Soques (128, **A case of alexia, or verbal blindness, with autopsy**) demonstrated anatomically a lesion of the uncinate gyrus with involvement of the subcortical fibres in a case of alexia. In reality this condition confirms the correctness of the theory recently advocated by Pierre Marie concerning the localization of the aphasia. Berger.

Lazarew (129, **Amaurotic family idiocy**) describes three typical cases of amaurotic family idiocy. In the first case the commencement of the disease was noticed at the age of six months. A child of the same parents had previously died of the same disease. In the second case the child did not appear to be normal at the time of its birth. In the third case the child was brought to Lazarew at the age of seven months. All three patients were boys and Hebrews. The parents of all three were healthy and not blood relatives. The author gives a review of the literature on this subject.

Hirschmann.

Ach (130, **Paralyses of the ocular muscles after lumbar anæsthesia**) seeks to explain the paralyses of the abducens reported by various authors after lumbar anæsthesia. He thinks that in the dorsal position of the patient a fairly close occlusion of the space between the spinal cord and the posterior

wall of the spinal column takes place, so that the anæsthetic can mount to the brain only in the anterior portion of the canal. At the brain the first obstacle is met with in the pons, beneath which passes the abducens which is thus exposed to the action of the anæsthetic. Hence we have to deal here with a direct action upon the nerve and not upon its nucleus. The aqueduct is completely closed to the ascending stream. Experiments in regard to the currents in the spinal canal of rabbits have confirmed the author in his theory.

Koenig (131, **Peripheral optic neuritis. Surgical treatment**) recommends to treat the different forms of peripheral optic neuritis with sclerotomy, performed as soon as possible after the commencement of the disease. As the result of this operation he claims that there is resorption of inflammatory products and an improvement of vision. Frequently it is necessary to perform the operation twice. The author reports seven cases treated in this manner. Berger.

Lundsgaard's (132, **Hypermetropia in diabetes mellitus**) patient had 0.5 D of hypermetropia of each eye which became with the onset of an attack of diabetes 7 D of hypermetropia and returned to normal after the observance of a proper dietetic treatment.

Raimondi (133, **Double amblyopia with optic perineuritis occasioned by absorption of thyroid gland**) observed in a woman 45 years of age who had taken thyroid tablets for two months for the purpose of correcting her obesity, the onset of general nervous weakness, sleeplessness, and visual disturbances. She had a central scotoma in each eye with a lowering of the vision to $\frac{1}{10}$, and inflammatory changes in the optic papilla of each eye. Internal administration of quinine and arsenic with discontinuance of the thyroid treatment resulted in a cure with normal vision.

Scholz (134, **Statistics of tobacco and alcohol amblyopia**) has gathered 349 cases of tobacco amblyopia from the clinic of Grosz. According to his observations men only are affected, almost without exception. The vision of the diseased eyes varied from $\frac{5}{20}$ to $\frac{5}{70}$. The persons affected were accustomed to work in the open air. The cheaper kinds of tobacco are the more harmful. Hungarian tobacco has 2.2% of nicotine, Havana, Cuba, and Mexico tobacco 2.2%, cigarette

tobacco 1.8%. The foulness which accumulates in tobacco pipes and in the ends of cigars is particularly rich in nicotine.

Tojoda (135, **Two cases of chronic toxic amblyopia with transient complete blindness not due to the tobacco-alcohol intoxication, together with autopsy**) has observed two cases of sudden blindness which were associated with chronic retrobulbar neuritis. In one case carcinoma of the stomach was present without involvement of the optic nerve, and the amaurosis was ascribed to autointoxication caused by the carcinoma. In the other degeneration of the optic nerve caused by a chronic interstitial nephritis produced the toxic amblyopia.

BOOK REVIEWS.

XVI.—**Text-Book of Ophthalmology.** By Professor E. Fuchs, Vienna. Authorized translation from the eleventh German edition with numerous additions by Dr. Alexander Duane, New York, with 441 illustrations. Third edition. J. B. Lippincott Co., Philadelphia and London, 1908. Price $6.00.

The long-expected new English edition of Fuchs's text-book will be greeted with satisfaction by many. The last edition has been out of print for some years, depriving many English-reading ophthalmologists of the advantages of a book which occupies a unique position among German text-books. This new edition embodies the latest views on the science of ophthalmology, and is in every way up-to-date. Over 100 new illustrations have been added. The publishers are to be congratulated upon the excellent appearance of the book; the type, paper, and illustrations are equally successful. The translator's splendid work needs no other comment than that the original loses nothing in this rendering into another language. Dr. Duane's additions will be of particular value to the English-speaking student. In short this is a book that every ophthalmologist must have.

A. K.

XVII.—**Squint and Ocular Paralysis.** By E. Lucas Hughes, Liverpool. Pages 206. Illustrated. London, H. K. Lewis, 136 Gower Street, 1907.

Mr. Hughes has made a very good compilation of recent writings by British and French authors. The subject is divided as follows: Squint, ocular paralysis, disturbance of muscle-balance. Of interest is the description of the diplo-

scope of Dr. Rémy in Paris, a diplopia-inducing instrument which can be used in a number of ways, especially in medico-legal cases for the detection of malingerers. While there is no particular originality and the disputed questions in the subject are not critically reviewed, the book is unquestionably of value.

A. K.

XVIII.—**The Eye and Nervous System.** (Their diagnostic relations, by various authors.) Edited by W. C. Posey and W. G. Spiller. Published by J. B. Lippincott Co., Philadelphia and London, 1906. Pages 988. Illustrated. Price $6.00 net.

The design of the editors to get up a book, on the diseases of the eye and of the nervous system which are correlated, is surely timely and should be of value. The list of collaborators is long and representative. The subject is treated in a series of monographs which facilitate research; repetition of the same matter has been avoided. The subjects and authors of the various chapters are as follows:

W. G. Spiller, The Intracranial Portion of the Encephalic Nerves. W. N. Souter, Sight: The Structure and Optical Properties of the Eye. C. K. Mills, The Psychology of the Visual Act. Casey A. Wood, General Examination of the Eye. Alexander Duane, The Extra-Ocular Muscles. John E. Weeks, The Intra-Ocular Muscles. Edward Jackson, Peripheral Affections of the Fifth, Seventh, and Cervical Sympathetic Nerves. H. V. Würdemann, Diseases of the Retina. W. G. Spiller, Tumors and Other Lesions of the Brain. E. W. Taylor, Bulbar and Pseudo-Bulbar Diseases. William Hirsch, Arteriosclerosis, etc. F. X. Dercum, Parasyphilitic Affections. B. Sachs, Amaurotic Family Idiocy. Charles W. Burr, Developmental Abnormalities of Brain and Skull. T. H. Weisenburg, Diseases of Spinal Cord and Nerves. G. E. de Schweinitz, Neuroses and Psychoses. J. H. Lloyd, Migraine, Tetanus, Epilepsy, Blindness Due to Uræmia. S. D. Risley, Neuroses and Other Conditions Occasioned by Errors in Refraction and Motility. H. F. Hansell, Epilepsy. W. C. Posey, Exophthalmic Goitre. W. C. Posey, Psychological Effects of Operations on Eyes. C. H. Frazier, Surgical Treatment of

Intracranial Lesions. Joseph Sailer, Tremors, Reflexes, Gaits. G. L. Walton, Degeneracy.

A. K.

XIX. — **Diagnostik der Bewegungstörungen der Augen** (Diagnosis of Disturbances of Ocular Movements). By Dr. E. Landolt, Paris. With 23 text-figures. Pages 94. W. Engelmann, Leipzig, 1907. Price 3.60 Mk.

This short treatise by the well-known Paris ophthalmologist on this important and difficult subject, deals first with some features in the anatomy and physiology of the eye-muscles; the symmetrical movements of the eyes and the practical use of prisms are next taken up. The disturbances of motility are divided into: (1) concomitant squint; (2) paralytic squint; (3) disturbed associated movements; (4) paradoxical disturbances. The symptoms of paralysis of the eye-muscles are carefully and graphically described. Finally the nature and location of the cause of the motor disturbance is considered. The author's investigations in this field are classical and his extremely practical and compendious monograph is a valuable addition to the books on this subject.

A. K.

XX.—**L'œil artificiel** (The Artificial Eye). By Dr. R. Coulomb. 27 photographs and 123 figures. Pages 152. J. B. Ballière et Fils. Paris, 1907.

This book is the graduating thesis of the author, who comes of a family which has been devoted to the manufacture of artificial eyes for seventy years. This special part of ophthalmology concerns an art often unappreciated and sometimes looked down upon. Information on ocular prothesis is useful in many ways. The maker of the artificial eye and the operator are to a certain extent dependent upon one another for the success of the final result. The book gives a description of the artificial eye, its origin, process of manufacture and its uses. The different conditions are given in which its application is practicable, with advice on its use and the inconveniences which result from too long a use and from an improper fit.

A. K.

XXI.—**Bier's Hyperæmic Treatment.** By Willy Meyer,

M.D., and Prof. Victor Schmieden. Octavo of 209 pages, illustrated. Philadelphia and London: W. B. Saunders Co., 1908. Cloth, $3.00 net.

Bier's hyperæmic treatment has now been in use for 15 years. Its results have been valuable so that a comprehensive manual on this form of treatment seemed needed. The authors are particularly fitted for this task as one of them, Dr. W. Meyer, was one of the first to apply this treatment in America and has remained an ardent advocate, while the other, Professor Schmieden, Professor Bier's assistant, reports on the experiences of the German clinic. After a general part on description and application of the method, the special indications in the various fields of medicine are taken up in turn. In this, general surgery occupies the greatest part. A chapter of three pages deals with hyperæmic treatment in ophthalmology. The obstructive hyperæmia is obtained by a neck band and by suction glasses. The optic nerve and the retina participate in the effects of a moderate hyperæmia, such as results from the application of the neck band. It is stated without any further citation that marked improvement has been seen in a few cases of progressive optic atrophy with pronounced anæmia of the optic nerve. The elastic band remains in place for eleven hours twice a day. The treatment is advocated in acute dacryocystitis, interstitial keratitis, and sympathetic ophthalmia. In inflammations of the eyelids and conjunctiva the congestion is produced by a suction glass, a small glass cup attached to a rubber bulb. This is applied for 15 to 30 minutes, two or three times daily.

A. K.

XXII.—**A Study of the Ocular Manifestations of Systemic Gonorrhœa.** With Report of Cases of this Nature. By W. G. M. Byers. Studies from the Royal Victoria Hospital, Montreal, vol. ii., No. 2, February, 1908. Pages 131. Price $1.00.

As is stated in the preface, the writer has attempted to gather all that is good of that written on the subject of gonnorrhœal ocular metastases, in the hope of arriving at some degree of finality. Though this has not been attained, the field has at least been cleared and the way shown for much needed work. After an historical introduction and

general remarks on pathology, clinical features, and treatment, each part of the eye affected in gonorrhœa is taken up in turn. This included the conjunctiva, cornea, sclera, uvea, optic nerve, and retina, tenonitis, and dacryoadenitis, with an exhaustive number of case reports and one (irido-cyclitis) microscopically examined by the author. The following are some of the author's conclusions: Gonococci and not their toxins or secondary or mixed infections cause the local manifestations. Ocular lesions are often the first evidences of systemic gonorrhœa, and there is every reason to believe that they frequently form the sole expression of this condition. The conjunctivitis in 30 per cent. of the cases is complicated by affections in other coats of the eye. A keratitis occurs which is of a multiple and superficial nature, commonly symmetrical and central in situation. In every so-called iritis the ciliary body is involved. Generally speaking, metastatic affections of the uveal tract tend to be double-sided in the first as compared to the second and later attacks, and to relapse and to recur with fresh gonorrhœa. This elaborate and instructive monograph is a valuable contribution to our knowledge of this interesting group of diseases.

A. K.

NOTICES.

The annual post-graduate course in ophthalmology at the Oxford Eye Hospital this year lasts from July 6th to 18th. The last three days will be devoted to addresses and demonstrations by distinguished English and foreign surgeons. This hospital has been established since 1886, and contains 32 beds. The staff consists of Messrs. R. W. Doyne and F. Menteith Ogilvie.

The annual meeting of the British Medical Association will be held at Sheffield, July 29th to July 31st, under the presidency of Simeon Snell, ophthalmic surgeon, Royal Infirmary, Sheffield. The president of the eye section is Sir Henry R. Swanzy.

The provisional program of the XVIth International Medical Congress to be held at Budapest, Aug. 29th to Sept. 4th, 1909, has been published. The following titles of papers in the Section on Ophthalmology are announced: Angelucci (Neapel). —Postoperative, durch Autovergiftungen begünstigte oder enstandene Augenentzündungen. Elschnig (Prag).—Prophylaxe der Infektionen bei operativen Eingriffen am Auge. Essad-Pacha (Constantinople).—Le trachome. Fuchs (Wien). —Postoperative chronische Augenentzündungen. Greeff (Berlin).—Aetiologie des Trachoms. Hess (Würzburg).—Über Staar- und Nachstaar-Operationen. Hirschberg (Berlin).— Prophylaxe des Trachoms. Jessop (London).—The Serum Treatment of Diseases of the Eye. Juler (London).—The Causes and Treatments of Concomitant Strabismus. Kuhnt (Bonn).—Operative Behandlung des Strabismus concomitans. Lagrange (Bordeaux).—Traitement du glaucome chronique. Landolt (Paris).—L'asepsie dans la chirurgie oculaire.

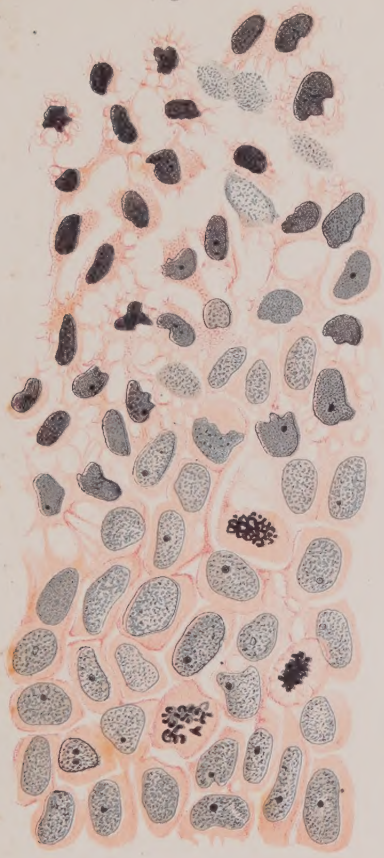
Lapersonne, de (Paris).—Du rôle des infections, particulièrement de la syphilis, dans la production des lésions de la myopie progressive. Morax (Paris).—Etiologie des infections postopératives subaiguës et tardives. Römer (Greifswald).—Serumtherapie in der Augenheilkunde. Schmidt-Rimpler (Halle).—Bemerkungen zur Glaukom-Therapie. Siegrist (Bern).—Die perforierenden Augenverletzungen und deren Behandlung. Sulzer (Paris).—Mesures internationales à prendre pour empêcher la propagation du trachome par les ouvriers flottants et les émigrants. Truc (Montpellier).—Traitement du glaucome chronique. Uhthoff (Breslau).—Neuritis optica und intracranielle Tuberculose. Weeks (New York).—The Use of Sera and Antitoxins in Ophthalmic Practice, their Methods of Preparation, Methods of Use, and Results Obtained.

International Prize for Ophthalmology.—The royal Hungarian Minister of the Interior offers the sum of 1000 crowns as a prize to the author of the best work on the Etiology of the Trachoma. An indispensable condition is that the work must be original and up-to-date.

All works, whether in manuscript or published for the first time in 1907 or 1908, will be eligible for the competition, provided they are in English, Hungarian, French, or German, and they are received by the 31st December, 1908, at latest, by the Minister of the Interior. (**Address**: Belügyministerium, Budapest, Hungary.)

The jury will be appointed by the Minister, and their verdict will be announced at the inaugural sitting of the Congress.

Fig. 1.



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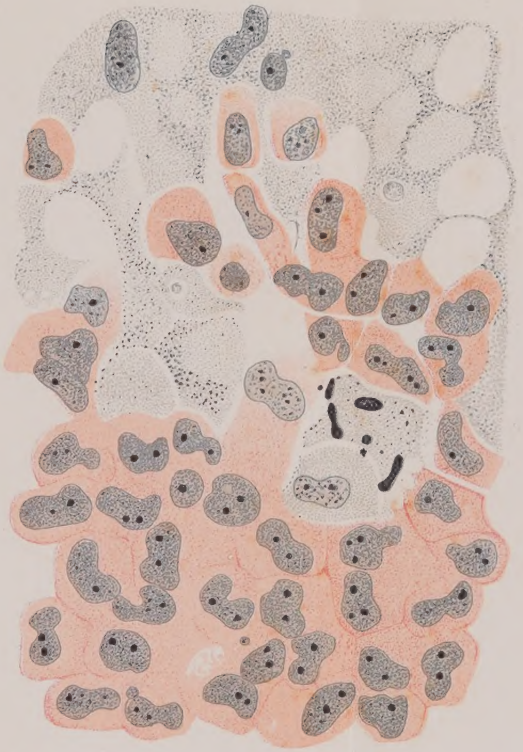

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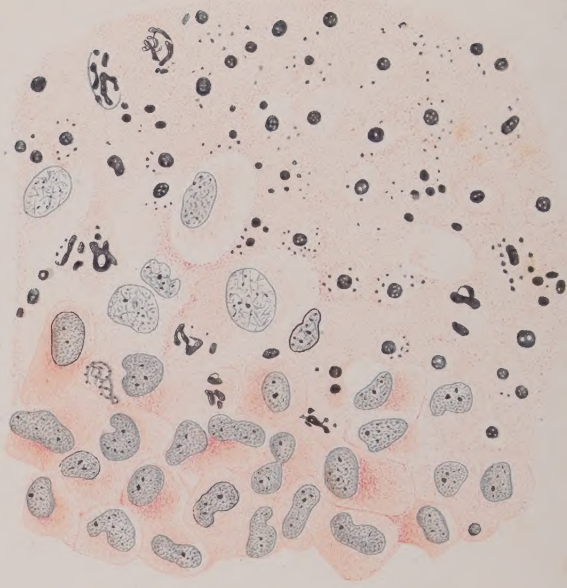

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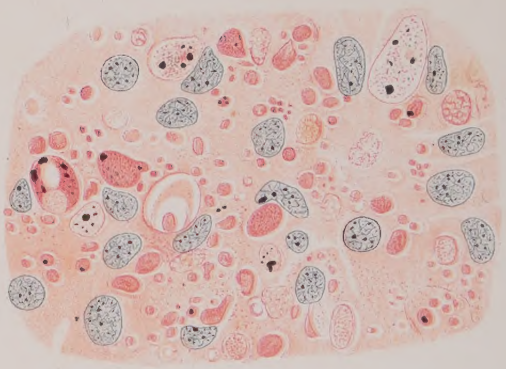

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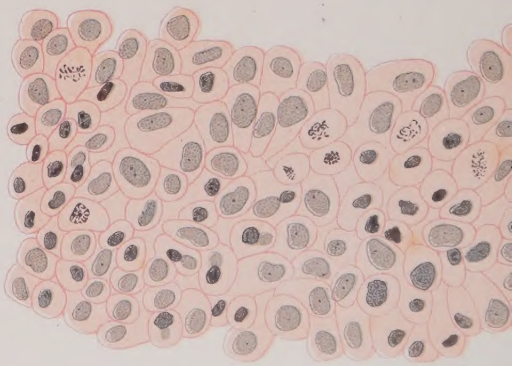

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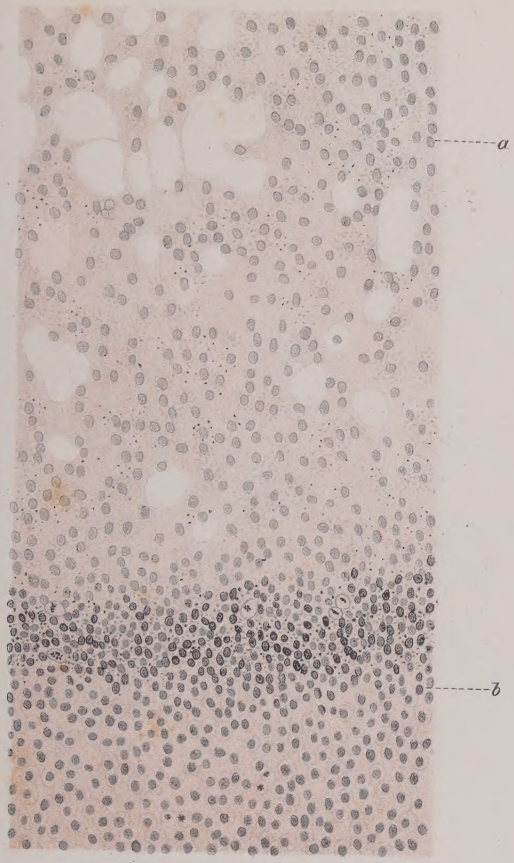
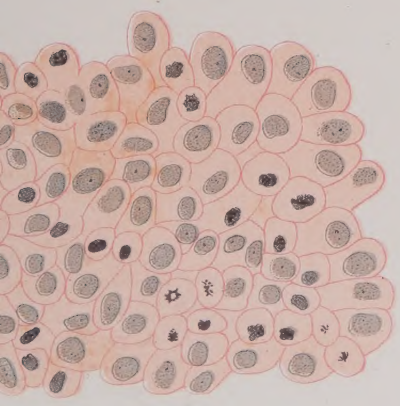


Fig. 6a

Fig. 6b



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